THE IRON AGE

New York, December 17, 1925

ESTABLISHED 1855

VOL. 116, No. 25

The Future of Merchant Pig Iron

High Freight Rates, Large Imports of Foreign Iron and Economic Changes Have Put Many Furnaces on Inactive List-By-Product Coke Ovens Considered as Possible Remedy

BY CLARENCE E. WRIGHT

NLY 10 of the 44 so-called merchant blast furnaces supplying pig iron to foundries in the Atlantic seaboard States were in operation on Dec. 1. The 44 furnaces are located in New York, eastern Pennsylvania and Virginia. Some of them have not been operated for a year or more; others have been idle most of the time since the war. Large amounts of capital invested in such furnaces are yielding no return, and the future of the domestic merchant pig iron industry, particularly in the eastern States, where it is seriously affected by imported iron as well as by high railroad freight rates and other economic changes, is giving concern to all who are financially interested.

About 400,000 tons of foreign iron has come in this year, much of it at Atlantic ports. This is approximately double the amount imported in 1924. bered among the idle domestic furnaces are some highcost plants which cannot successfully compete with the low-priced iron from abroad. Several of the idle furnaces may never operate again, while the problem of the others, a few of which have been modernized at great expense, is to find ways and means of meeting the new situation the pig iron industry faces. In the minds of some who are vitally interested in the problem the construction of by-product coke ovens in conjunction with existing blast furnaces is believed to be the ultimate solution. The construction of new capacity such as the Mystic furnace, near Boston, and the Troy, N. Y., furnace of the Hudson Valley Coke & Products Corporation, both of which are linked to by-product coke plants, is being watched with interest by other pig iron producers whose furnaces have not been able to operate profitably

The Virginia pig iron situation is probably the most serious. Only two of the 17 furnaces in that State have been in operation for any considerable part of this year. High railroad freight rates to most of the districts in which Virginia iron was formerly distributed have effectively kept that iron out of its accustomed channels and relief which was asked for from the railroads through the Interstate Commerce Commission has not been forthcoming.

The Case of Virginia Furnaces

In Virginia the subject of construction of a byproduct coke and gas plant to serve all of the furnaces is now being seriously agitated. The effort made about two years ago to obtain a gas contract from the city of Richmond is being revived and a more hopeful attitude prevails as to the possibility of success. stumbling block is that the Richmond city charter provides that its gas contract must be renewed from year to year. Capital could not be found to finance the construction of a by-product coke plant there unless a 20-year contract with the city could be entered into, and this would involve an amendment to the city charter by the State Legislature. However, some of the

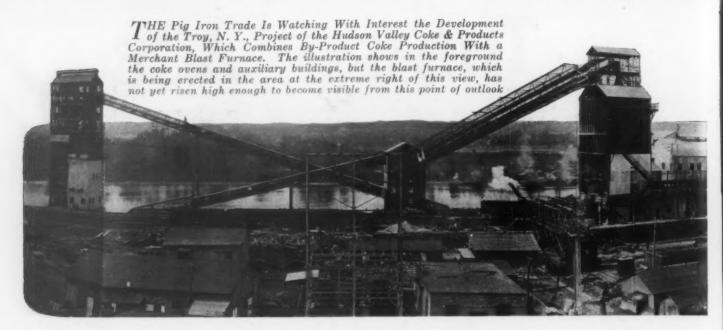
Virginia pig iron producers are bending their efforts to bringing about that result, and if the way should be paved for a Richmond coke plant it is considered likely that it would serve the Virginia furnaces with fuel on a basis permitting them to operate more economically and meet the competition of producers in other districts.

New Jersey and Delaware River Coke Plants

Although it has not yet gone beyond the discussion stage, there is a possibility that a by-product coke



The Mystic Blast Furnace Near Boston, Which Will Be Completed and in Operation Early in 1926, Has Been Built in Conjunction With the Coke Ovens of the New England Coal & Coke Co., Situated About a Quarter of a Mile from the Furnace. The furnace will operate on foreign ore which will be unloaded at its own dock



plant may be built in New Jersey to supply gas to one or more of the New Jersey municipalities and to furnish fuel to the furnaces of the Replogle Steel Co. at Wharton, N. J. These two furnaces, which were completely rebuilt a few years ago, have been in operation only a fraction of the time. The coke project, if it goes through, probably will not be undertaken by the Replogle Steel Co., but by other interests cooperating with that company. The Wharton furnaces, although advantageously located with respect to supplies of New Jersey ores and also with respect to distribution of iron to a large consuming territory at favorable freight rates, have not attained the full advantage of their location because of low selling prices for pig iron and high cost of coke.

A project for the construction of a by-product coke plant on the Delaware River at Philadelphia has been discussed from time to time and is now being revived. The Philadelphia Foundrymen's Association has approached the question both from the viewpoint of bringing a new industry to Philadelphia and of possible savings on pig iron through more economical production. This project aroused active interest not many months ago through a proposal to build a coke plant and blast furnaces on the Delaware River adjoining a steel plant located not far from Philadelphia. latest proposal, which was brought out at a meeting of the Philadelphia Foundrymen's Association at the Manufacturers' Club, Philadelphia, last Tuesday evening, is to interest capital in the construction of blast furnaces in conjunction with a coke and gas plant, the gas to be supplied to the city of Philadelphia.

At this writing the city of Philadelphia and the United Gas Improvement Co., which now supplies gas to that city, are negotiating a new gas lease. Some of the city officials have been quoted as favoring the taking over of the city-owned gas plant and leasing it to another company to operate, and the subject is being gone into thoroughly, the city having employed William H. Blauvelt, who was consultant in connection with the coke plant and blast furnace of the Hudson Valley Coke & Products Corporation at Troy, N. Y. Whatever the outcome of these Philadelphia gas negotiations, it is fairly certain that efforts will be made to build a coke plant to supply gas to the company which contracts to furnish the city gas. It is stated that some of the capital necessary for the coke plant and blast furnaces has already been assured.

Walter Wood of R. D. Wood & Co., cast iron pipe manufacturers at Florence, N. J., was the spokesman at the foundrymen's meeting in favor of the construc-

tion of blast furnaces at Philadelphia. It was admitted that discussion of the matter was in the nature of propaganda, with the hope that capital might be attracted to the proposition. Mr. Wood, who has been for the past year or two one of the largest importers of pig iron, called attention to the economies which would be possible if blast furnaces were built at tidewater. He cited the case of a furnace company located not far from Philadelphia which has a total cost on shipment of foreign ore from docks to its plant and on shipment of the pig iron back to Philadelphia of about \$2 a ton, and he said this could be saved by a plant having ore docks adjacent to its plant. He further cited the low freight rates available on pig iron when transported by water instead of by rail. A considerable part of the iron made at Philadelphia, he said, could be shipped to plants having access to water transportation. Wood expressed the belief that the manufacture of pig iron at lower costs is the best possible means of making it difficult, if not impossible, for foreign producers to ship so much iron to this country as has come in during the past year.

Capital Available for By-Product Plants

It is freely stated by those in the pig iron trade who have considered the subject that capital is readily available for the construction of by-product coke plants if a profitable outlet for the gas can be found. The place which coke has taken in the public mind during the anthracite coal strike is given as a reason for the willingness of investment companies to undertake the financing of coke and gas plants. Moreover, by-product coke has been supplanting beehive coke in recent years to such a large extent that the almost complete absorption of the coke business by by-product plants is not very remote.

In 1913 by-product coke production was less than 30 per cent of the total; in 1918 almost half of the total coke production was by by-product ovens, and the gain of by-product coke has been steady ever since. In 1923 beehive coke made a temporary recovery of a part of its lost tonnage, producing more than 30 per cent instead of only about 20 per cent as in 1921 and 1922; but in 1924 by-product coke shot farther ahead, beehive ovens producing only 22 per cent. In 1923 the total coke production was 56,977,534 tons, of which 37,597,664 was by-product and 19,379,870 was beehive. In 1924, a year of low production, the total was 43,663,000 tons, of which 33,995,000 was by-product and 9,668,000 was beehive. By-product coke production this



year will probably be well in excess of 35,000,000 tons, the total up to Oct. 31 having been 32,650,000 tons, while beehive production for the year will be 10,000,000 tons or more, the aggregate reached on Nov. 28 having been 9,357,000 tons.

By far the largest part of the coke production is charged in blast furnaces, but the increased use for heating purposes—a market which some producers will make strenuous efforts to retain—has awakened interest on the part of a number of pig iron interests in coke production as an auxiliary to the blast furnace. Wellinformed spokesmen for the pig iron industry consider that this may be the most important development in connection with the blast furnace in the next few years.

FAVORS ARBITRATION

Mining Congress Indorses President's Suggestion for Settling Industrial Disputes

WASHINGTON, Dec. 15 .- The American Mining Congress at the close of its twenty-eighth annual convention here last Friday, adopted resolutions which, among other things, indorsed the principle set forth by President Coolidge in his message to Congress for the settlement of industrial controversies by arbitration. The Mining Congress also approved the transfer of the Bureau of Mines from the Department of the Interior to the Department of Commerce and commended Secretary Hoover for the high type of men chosen to administer the work of the bureau.

Among other resolutions was one which commended the Ways and Means Committee of the House of Representatives for its "non-partisan and fair manner in drafting tax legislation," but called attention to the fact that recommendations are to be made for changes in the provisions of the law with reference to Federal taxation of mines. The mining industry, according to the view of the Mining Congress has not been afforded an opportunity to present facts to refute attacks against it.

In addressing the congress, Secretary of Labor Davis touched upon controversies in the coal mining industry and declared that the principal trouble in the bituminous fields was over-development. He suggested that both the anthracite and bituminous industries set up a fact finding commission made up of both operators and miners with a neutral representative as chairman in order to prevent strikes and to keep industry stabil-

ized and operating smoothly.

Gilbert Montague, of the New York bar, told the Mining Congress that 25 years of experience anti-trust laws has conclusively established that it is folly to apply them to the natural resources of the United States. Prosecutions against producers and distributers of natural resources, he said, have been spectacular and well advertised. As a result of the fear of anti-trust laws, he asserted, employers are reluctant to engage in collective bargaining, operators are prevented from going into consultations or cooperative arrangements which would prevent demorali-

zation by high-cost operating units, and distributers are afraid to join in combinations that might prevent duplicated, high-cost distribution. Mr. Montague cited a number of laws which granted exemption from antitrust prosecution, and declared:

Should Congress delay its discharge of this clear duty, the Federal courts may in time, as in the past, through the ever-growing "rule of reason" in their interpretation of the anti-trust laws, accomplish a certain degree of relief.

Recent Supreme Court decisions carry a strong intimation of this trend,

Consolidations and combinations, bringing about less waste, greater stability, and real economies in the production and distribution of natural resources, are likely in the future to be more sympathetically viewed by the courts.

The Mining Congress also was addressed by William E. Humphray, of the Federal Trade Commission, who

E. Humphrey, of the Federal Trade Commission, who spoke of benefits from the new rule of stipulation under which the commission now operates. He said that by this new rule the commission has settled more than 75 per cent of the cases promptly, saving time for the commission and money for the taxpayers, preventing wrong by unjustified publicity both to the public and to the accused, and more fully protecting the public's interest.

The following officers of the American Mining Con-

gress were elected:
President, Col. Daniel B. Wentz, Stonega Coal & Coke Co., Philadelphia; vice-presidents, Robert L.
Third Verde Copper Co., Jerome, Ariz.; B. L. Tally, United Verde Copper Co., Jerome, Ariz.; B. L. Doheny, Los Angeles, Cal.; W. H. Lindsey, Napier Iron Works, Nashville, Tenn.; secretary, J. F. Callbreath, Washington, D. C.; member of the board of directors, George B. Harrington, Wilmington & Franklin Coal Co., Chicago.

To Discuss Labor Turnover

Labor turnover will be discussed at the Tuesday morning, Dec. 29, session of annual meeting of the American Statistical Association, to be held at the Hotel Pennsylvania, New York, Dec. 28, 29 and 30. Papers will be presented on the following phases of the subject: The measurement of labor turnover as a problem of management; the best measure of labor turnover; the significance of statistics of labor turnover; and the place of statistics of labor turnover in a program of governmental labor statistics.

Testing Metals for Aircraft

Selecting Representative Samples-Proper Design of Test Specimens and Methods of Loading Them

BY N. S. OTEY*

HE standardization of physical tests used in predicting the characteristics metals will display in service offers many problems for investigation. Chief among these are selection of representative samples, design of specimens and methods of loading. Much consideration has been given these problems by various government bodies, technical societies and in-

60°V Notch Type 1 Type 2 Type 3 Type 4 Type 5 Type 6

Fig. 1—Various Geometric Types of Test Specimens Used

dustrial organizations, with the view of establishing standards to meet the general needs of collective in-

There are, however, certain economic considerations to be found in individual industries which govern the degree of refinement extended to the control of variables. These conditions do not minimize the value of general standards for physical tests but rather emphasize the importance of their being fundamentally sound and capable of giving results that will meet the most critical needs. If any leniency is to be allowed it should indeed be left to the individual industries. It is well to remember that, in order for standards to remain healthy, the maximum cumulative error that may occur under their use must be well within reasonable working conditions required by the industry in which they are

Because of the ever present demand for weightsaving in aircraft, there is perhaps no other industry requiring more accurate knowledge of metals. Simplicity and ease with which results can be interpreted and applied to design have rendered physical testing the most active agent in supplying this knowledge. The important factor in aircraft design is cost per tonmile for transporting pay load over a reasonable course. In order that this may be decreased it is necessary to keep structural weights at a minimum, which

can be done only through an accurate knowledge of materials and conditions to be met in performance.

Selection of Representative Samples

Strictly speaking, the test results obtained from a metal specimen represent only that particular piece at point of fracture. However, there are advantages to be gained by saving some stock for construction, which makes certain concessions necessary, and there troubles begin.

The major responsibility for the selection of representative samples rests with the manufacturer in the use of uniform raw materials and maintaining uniform smelting and rolling practice. Unless the metals supplied are uniform within specified limits, no amount of physical testing short of a specimen from each bar

will give representative results.

Even under the best mill control, there is considerable danger of impurity segregations and piping at the center of large bars, forgings and sheets. condition is more prevalent in aluminum alloys than in steel, which is partly due to the newness of the art. The location of specimens then, with respect to longitudinal axis of bars, forgings and sheets, will vary with materials and sizes.

The important actions to be taken may be summarized thus:

Maintaining uniform mill practice

Maintaining complete historical information from

raw materials to finished metals.

Establishing standard methods of sampling which will insure reliable knowledge of the metals furnished.

Design of Specimens

In general the results of physical tests are most affected by the geometric shape of the specimens used.

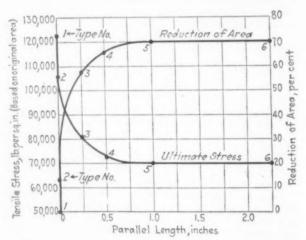


Fig. 2-Charted Physical Test Results of the Six Types of Test Bars

For example, two tensile specimens of each type shown in Fig. 1 were prepared from a single bar of mild car-bon steel and tested under identical conditions with results shown in Figs. 2 and 3. The reduction of area (waisting) in types 1 and 2 was negligible, due to the supporting shoulders being near the point of failure, whereas type 6 showed 70 per cent reduction of area. This is an extreme case and would have shown less apparent variations in properties if a harder metal had

^{*}Engineer of Tests, Naval Aircraft Factory, Philadelphia.

been used. However, it will serve to emphasize the possible discrepancies that may be incurred through variations in geometric shape of the specimen.

Again, it is common practice to specify that tubing

shall have certain tensile properties when tested in either full section or flat specimen. Ordinarily tubes which have a tensile strength within the capacity of the largest testing machine available are pulled in full section, while larger tubes are flattened and specimens prepared similar to those used for sheet metals. Tables I and II show some of the results of this practice, where it will be noted that per cent elongation is

primarily affected.

Abrupt changes in contour of a stressed member introduce components with consequent resultant stresses of higher intensity than the loading would introduce The intensity of these, resultant otherwise produce. stresses is directly proportional to the abruptness of change in contour, whereas the area affected is greater for more gradual contour changes. Such a condition is found at the shoulder radius of the ordinary round and fiat tensile specimens and many failures that occur at this point can thus be accounted for. Because of

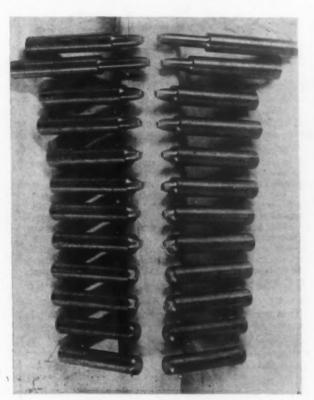


Fig. 3—Appearance of the Broken Test Bars of Six Different Types or Shapes

the complexity of these stresses, they have almost completely eluded mathematical analyses, but by photoelastic methods' they have been clearly isolated and measured.

For design information Fig. 4 shows approximately how these complex stresses occur in tensile specimens. It will be noted that the region of high stress extends into the parallel gage portion of the specimen and, if the true tensile properties of the material are to be determined, it is necessary that these abnormal stresses be eliminated from that section of the specimen shown as the gage length. This can be done by increasing the parallel length sufficiently to allow a gage length of material which will be subject only to pure tensile stresses. The amount by which the parallel length must be increased is directly proportional to the shoulder radius, and for this reason it is desirable to keep the shoulder radius as small as practicable without incurring abnormal stresses of sufficient intensity to cause failure at that point. Referring to Figs. 1 and 2, it will be seen that, even with a 1/4-in. shoulder radius, this region of high stress extends more than 1/4 in. into the parallel gage section, otherwise type 4 specimen would have shown the true strength of the material.

Another factor which contributes to these abnormal stresses at the shoulder radius is the relative enlargement of the gripping end of the specimen. It has been found that failures near the shoulder are practically eliminated if the enlarged ends of specimen are not more than 13 per cent larger in diameter or width than the gage section. This simply reduces the abruptness

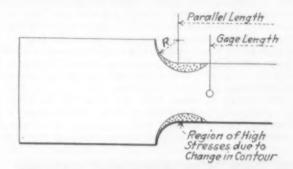


Fig. 4-How Complex Stresses Occur in Tensile Specimens

of change in contour. For a more detailed explanation and quantitative analysis of these conditions the reader is referred to the very creditable work of Professor Coker', and of H. A. Anderson' of Bell Telephone Laboratories, Inc., New York.

When preparations were being made for the construction of the American airship "Shenandoah" at the Naval Aircraft Factory, the question was raised as to the best type of tensile specimen to use for testing duralumin sheet metal. The results of this investigation are timely for showing some of the effects of variations in gage width, parallel length and gage width, thickness ratio. This investigation covered a width-thickness ratio. This investigation covered a range of gage widths from 0.185 in. to 1.250 in., sheet thicknesses from 0.015 in. to 0.250 in. and parallel lengths from 2.250 in. to 3.500 in., the gage length in all cases being 2 in. Space will not permit a complete report of the investigation. However, the results of two series will cover the important points, since they are typical of the lot.

Series A

This series represents the results of check tests made on three types of specimens found to be the most favorable for the range of sheet thicknesses covered.

These specimens are shown in Fig. 5.

Material—The material used was an aluminum alloy, duralumin, having the following specified com-

position:

 Per Cent
 92 Min.

All the material used was made by the same manu-



Fig. 5—Three Types of Specimens Found to Be the Most Favorable for the Range of Sheet Thick-

			-Inches	
Type	Symbol	H	P	W
A		0.67	2.25	0.500
B	0	0.67	3.50	0.500
C	Δ	1.00	3.50	0.750

facturer and under strict supervision and inspection. Preparation-All specimens of a given thickness were cut from a single sheet and the three types taken

^{1 &}quot;Tension Tests of Materials," by Prof. E. G. Coker, "Engineering," Jan. 7, 1921, 35 and 36 Bedford Street, Strand, London, W. C. 2.

2 "Tension Tests of Thin Gage Metals and Light Alloys," by H. A. Anderson, Proceedings American Society for Testing Materials, page 990, Vol. 24, Part II, 1924, 1315 Spruce Street, Philadelphia.

alternately, so that the distribution over the sheet was the same for each type. The direction of rolling was parallel to the longitudinal axis of the specimens.

Heat Treatment—All specimens were packed (different types alternating) and heat treated at the same time, as shown in Fig. 6. During this operation they were so arranged that the spacing was equal to the sheet thickness, to insure uniform cooling when quenched. Heating was done in a 50-50 salt bath of sodium and potassium nitrates to a temperature of 500 deg. C. They were quenched in water at 21 deg. C. and allowed to age in still air at room temperature for 20 days before testing. No care was spared in preparing, heat treating and testing these specimens, to insure uniform procedure.

The results of these tests are compiled in Table III. Figs. 7 to 9 inclusive show the elongation values for comparison of the three types of specimens. An explanation of one of these curves will serve for the

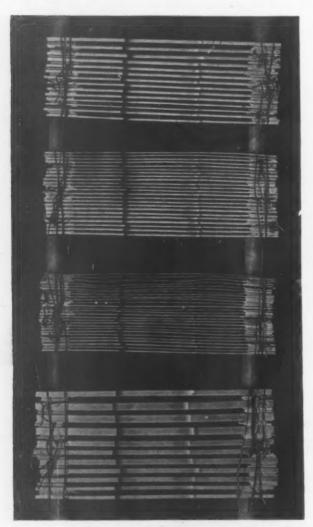


Fig. 6—Packing of Types of Test Specimens for Heat Treating

entire series: In Fig. 7 the elongation values for type A specimens (see symbols in Fig. 5) are plotted to the ordinate scale and along a straight line curve having a slope of 45 deg. In this way the curve is made to represent every elongation value for type A specimens. This curve is used as a basis for comparison and for convenience will be called the base curve. Next the elongation values for types B and C specimens are plotted to the ordinate scale and on vertical lines corresponding in sheet thickness to the points for type A specimens. Thus it will be seen that all points having the same abscissae represent a single thickness of sheet and are directly comparable on the ordinate scale. Similarly in this series of curves each type of specimen is compared with the other two types for percentage elongation in 2 in. Ultimate stress values can be plotted in the same manner.

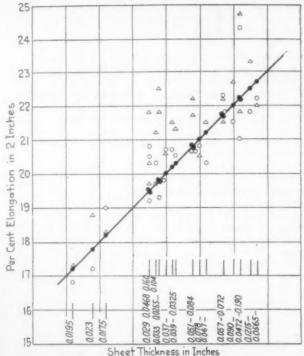


Fig. 7—Results of Tests of Type A (Fig. 5) Plotted on the Basis of Data in Table III

The following observation can be made from these curves and Table III:

Fig. 7 and Table III show that Type A specimens give lower elongation and higher ultimate stress values than other two types, because of the shorter parallel length.

parallel length.

Fig. 8 and Table III show that type B specimens give values which are a fair average of the three types.

Fig. 9 and Table III show that type C specimens give uniformly high elongation values and low ultimate stress values, due to the greater volume of material which in this shape allows greater deformation (waisting). This will be further demonstrated in the next series.

Series B

This series represents the results of tests intended to show the effects of varying the gage width-thick-

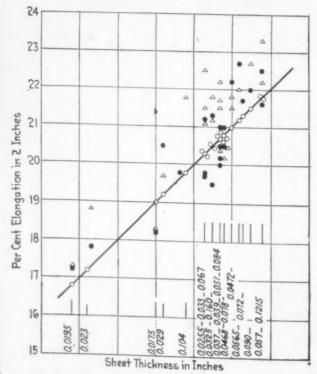


Fig. 8—Results of Tests of Type B (Fig. 5) Plotted on the Basis of Data in Table III

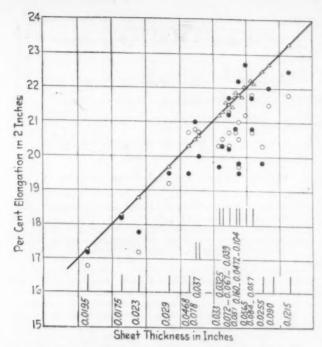


Fig. 9—Results of Tests of Type C Plotted on the Basis of Data in Table III

All of these specimens were made from two sheets of duralumin 0.065 in. thick and 0.035 in. thick respectively and to the shapes shown in Fig. 10. The selection of material was made as follows:

Five sheets of each thickness were examined for tensile properties, using geometrically similar speci-mens. From these tests, one sheet of each thickness

was selected, which two sheets showed the same physical properties, within close limits.

These two selected sheets were then cut into pieces 10 in, square and three geometrically similar tensile specimens tested from each square. From these test results, pieces were selected from each sheet which had practically identical properties. The sam-ples thus selected were very uniform and the two thicknesses permitted a wide range of W/T ratio.

The same methods of alternate cutting, packing, heat treatment and aging as described for series A

Table I.—Comparative Tests of Full Section and Flattened Specimens. Carbon Steel Tubing (1025) Tested as Received

Specimen	Yield, Lb. S	Tensile Strength, Lb. per Sq. In.	Elonga- E tion in 2 In., (Ratio (B) to (A),
1% in., 16 ga. tubing		per mg		
Tube (A)		84,900	24.0	49.5
Flat (B)	79 000	90,900	11.88	
11/4 in., 16 ga. tubing	K		-	
Tube (A)		91,200	21.4	44.0
Flat (B)		82,900	9.44	* * 5
1 in., 16 ga. tubin	g			
Tube (A)	. 61,600	74,500	25.5	59.5
Flat (B)		77,600	15.2	
% in., 16 ga. tubin				
Tube (A)		73,800	23.1	60
Flat (B)	. 67,200	72,100	13.9	* * *

All of above values are average of two tests. All flat specimens cut adjacent to tube specimens.

Flat-Table II.—Comparative Tests of Full Section and Fi tened Specimens of Duralumin Tubing—Heat Treated

Yield, Lb. S per Sq. In.	Tensile strength, Lb. per Sq. In.	Elonga- E tion in 2 In., (Per Cent	Ratio B) to (A),
. 36,700 . 46,100	60,400 62,100	21.5 18.6	86.5
. 38,400 40,600	55,200 56,100	25.0 17.8	71.2
	59,300 60,2 50	$\frac{25.8}{17.0}$	66
	per Sq. In. a. 36,700 46,100 a. 46,100 a. 40,600 a. 42,150	Tensile Yield, Lb. Strength, Lb. per Sq. In. per Sq. In. a. 36,700 60,400 46,100 62,100 a. 38,400 55,200 40,600 56,100 a. 42,150 59,300	Tensile tion Yield, Lb. Strength, Lb. in 2 In., (per Sq. In. per Sq. In. Per Cent a. 36,700 60,400 21.5 46,100 62,100 18.6 a. 38,400 55,200 25.0 40,600 56,100 17.8 a. 42,150 59,300 25.8

were used. The results of these tests are shown in Table and Fig. 11. So far as the writer is aware it has been generally believed that the more nearly a rectangular specimen approached a square cross section the greater would be the deformation under tensile loading. These results clearly show that this is not the case. Further demonstration of increased deformation with increased width-thickness ratio between the limits of 1 and 30 is shown by comparing Fig. 8 with

Fig. 9.
It is evident that even slight variations in geometric shape of test specimens have effects that will be readily reflected in the test results and that much care should be used in selecting standard test specimens for aircraft work, where specifications are necessarily very rigid.

Barba has pointed out that "Geometrically similar bodies of the same material, under identical conditions of stress, undergo similar deformation." The use of this fundamental law in the design of round tensile specimens is especially important. Since they have to be machined separately, they can be made geometri-cally similar and in various sizes without causing variations in test results. In the case of flat specimens, however, the solution is not so simple, as individual machining would entail prohibitive expense. The alternative here is so to design and standardize the speci-men that the true properties of the material will be measured and then calibrate it for the various thicknesses of sheet and materials it may be called upon to represent.

The writer is conducting a series of tests on carbon steel, alloy steel and duralumin tubing to determine the comparative results to be expected from use of flat and full section tensile specimens and if possible to establish a fundamental basis for their design.

Methods of Loading

The laboratory technique best suited to the various industries will depend largely on the size and kind of

Table III.—Results of Tests on Duralumin Sheet U.
Three Types of Specimens Shown in Fig. 5. All Values
the Average of Three Tests

Sheet		Clongation In., Per		Stress,	Ultimate Lb. per Sq	. In.
in Inches 0.0155 0.0175 0.0195 0.023 0.0255	Type A 14.5 18.2 17.2 17.8 19.8	Type B 14.5 19.0 16.8 17.2 20.3	Type C 14.0 18.3 17.3 18.8 22.5	Type A 63,000 63,700 64,100 64,300 61,300	Type B 63,500 64,700 64,100 63,000 64,100	Type C 61,700 59,200 62,300 62,400 61,100
0.029	19.5	19.2	19.7	59,300	58,400	58,700
0.0325	20.3	20.0	21.3	66,700	60,900	60,400
0.033	19.7	20.3	21.2	62,200	65,800	66,200
0.037	20.0	20.7	20.6	61,700	61,100	60,800
0.039	20.2	20.7	21.5	63,500	63,300	61,600
0.0468	19.5	20.8	20.3	66,100	65,080	64,500
0.0472	22.2	21.0	21.8	60,900	63,000	63,000
0.051	20.8	20.7	21.7	60,700	60,900	59,800
0.0565	22.7	21.2	22.0	62,900	61,400	60,900
0.057	21.7	21.8	22.2	61,500	61,200	60,800
0.067	21.2	20.3	21.5	63,100	62,800	62,800
0.072	21.7	21.3	21.5	63,200	61,700	62,500
0.078	21.0	20.8	20.5	63,300	63,100	63,300
0.084	20.8	20.7	22.2	61,100	60,800	61,400
0.090	22.0	21.5	22.7	62,300	60,500	60,800
0.104 0.1215 0.160 0.190 0.256	19.8 22.5 19.5 22.2 24.5	19.8 21.8 20.5 24.3	21.8 23.2 21.8 24.7 26.2	63,500 59,000 87,500 62,300 60,500	62,400 58,100 58,300 62,100 59,800	63,000 59,100 58,700 62,100 60,000

Table IV.—Results of Test on Duralumin Sheet Using Types of Specimens Shown in Fig. 10. All Values Are Average

		of Five Tel	IC8	
Sheet Thickness	Gage Width	W/T Ratio	Elongation in 2 In., Per Cent	Tensile Stress, Lb. per Sq. In.
0.065 0.065 0.065	0.19 0.33 0.52	2.89 5.0 8.0	18.0 18.6 19.8	59,300 60,400 60,200
0.065	0.65	10.0 10.15	20.5 20.6 21.4	59,200 59,900 59,900
0.065 0.065 0.065 0.065 0.085	0.75 1.02 1.31 1.99 1.19	11.7 15.6 20.1 30.5 34.1	21.5 22.4 22.8 21.8	60,100 60,400 59,000 60,800
0.035 0.035 0.035 0.035	1.37 1.52 1.71 1.83 2.05	39.1 43.8 48.8 52.1 58.5	21.4 22.4 23.9 22.0 21.5	60,100 60,400 60,300 59,500 60,500

metals used. Most of the structural metals used in aircraft construction are either ferrous or non-ferrous alloys and are furnished in comparatively small sizes, such as wire and rod diameters from 0.010 in. to 2 in., sheet thicknesses from 0.008 in. to 0.250 in. and tubing from 7 to 35 D/T ratios. The requirements for reliable loading conditions are further complicated by these alloys being tested in the heat-treated condition.

Erroneous test results traceable to methods of load-

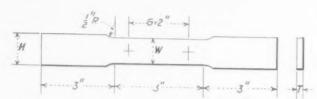


Fig. 10—Type of Test Bar Used in Studying the Effect of Varying the Gage Width-Thickness Ratio When H=1.13~W With the Values of T, W and W/T Shown in Table IV

ing can usually be attributed to one or more of the following conditions:

Lack of Positive Gripping.—The gripping devices used in pulling tensile specimens are important, in that slipping during test is likely to result in false yield points or erroneous extensometer readings, to say nothing of time wasted in conducting the test.

Mis-alinement.—Since it is practically impossible to maintain axial alinement of universal testing machine heads, eccentric loading of specimens occurs universal socket arrangement is used as an

less some universal socket arrangement is used as an integral part of the grips.

Tearing Stresses.—The commonly called tearing stresses are the result of uneven gripping of specimens. This condition arises in testing sheet or plate specimens with gripping devices which have no self-

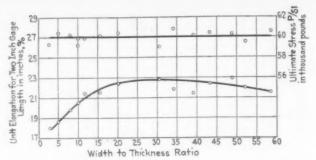


Fig. 11—Charted Results of Data in Table IV

adapting features to compensate for variations in

ckness of sheet.

Speed of Loading.—Within the range of ordinary universal testing machines, the speed of loading has no noticeable effects on physical determinations. What is more important, however, is that the machine be operated at speeds which will permit accurate balancing and reading of loads at all times. Experience has shown that most aircraft metals should not be loaded at a faster speed of extension or compression than 0.25 in, per min, and in some cases slower speeds are

necessary.

Calibration of Machines.—It is necessary that the accuracy of testing machines be known at all times, since considerable error often results from this source. It is important that load determinations be well within ±0.30 per cent.

Insofar as possible all human factors which may

contribute to error should be eliminated through com-plete standardization of procedure. Too often the judgment of the operator is left unchecked, and de-tails not reported completely defeat the purpose of the tests

(To be concluded)

Technical Control in the Foundry Discussed at Boston

During the past few years the Ohio Brass Co., Mansfield, Ohio, has made notable strides in technical control in the foundry as an aid to the foundrymen. A. A. Grubb, director of the laboratories of that company, gave an outline of what has been accomplished in that direction to the members of the New England Foundrymen's Association, Dec. 9, at the Exchange Club, Boston.

To have proper technical control in the foundry it is necessary to have control of raw materials, processes, product and losses and to develop and improve processes, Mr. Grubb said. The purpose of raw material control is to adapt supplies as nearly as possible to specifications so as to determine if one is securing full value for money paid out and to hold producers of materials accountable. Adjustments in the matter of composition ingots alone has paid the company for the analysis of all raw materials. By control of fuel supplies the melting time for the company's malleable furnace has been materially reduced. The company also has reduced by one-third the cost of binder for its

core sands as a result of its control of sands.

The technical control of a product calls for five inspections for testing its fitness for service. By a series of charts maintained on the foundry floor for the molders' inspection, keen rivalry has been built up between the molding gangs, who strive to keep their charts as nearly perfect as possible. In the development and improvement of processes the company has given careful study to its electric furnaces. It has three types of furnaces in operation and with its control of raw material finds it can make as good metal with one as with the other.

The company also has made strides in the recovery of waste materials. A saving of at least half the cost of technical practice at the plant has been made by reclamation. The company discards no sands in its brass foundry. By a proper application of rebinding, used sands are reconditioned.

R. F. Harrington, Hunt-Spiller Mfg. Corporation, Boston, president of the association, presided at the meeting. meeting. He appointed a nominating committee, consisting of B. M. Shore, Walker & Pratt Mfg. Co., Watertown, George P. Aborn, Worthington Pump & Machinery Corporation, Cambridge, and E. H. Ballard, General Electric Co., Everett, which will select nominees for election as officers at the annual meeting next month. The Superior Sizing Co., Lockport, N. Y., W. Scott Thomas representative, was admitted to membership in the association.

Foundrymen to Conduct Symposium on Permanent Molds

Of especial interest to foundrymen planning to attend the Second International Foundrymen's Congress, to be held in Detroit the week of Sept. 27, 1926, will be the symposium on permanent and long life mold castings. This phase of foundry practice which has assumed such importance in the past few years will be thoroughly discussed at the meeting, the discussion being planned to cover non-ferrous, iron and steel practice, and to be international in scope.

The Cothias and similar processes used in England and France will be explained. The American practice developed in using oil-cooled molds for pistons, the process of using zinc-impregnated molds and the many other special developments in the field will be consid-

The committee organizing this symposium, under the direction of Jesse L. Jones, metallurgist Westing-house Electric & Mfg. Co., East Pittsburgh, will wel-come information from any one who has been instrumental in developing or carrying on work in this field of casting procedure.

The Republic Iron & Steel Co. is preparing to convert its plate mill at the Youngstown, Ohio, works into a universal mill, so as to diversify its output, and permit the rolling of skelp as well as the usual sizes of steel plates.

Economizes Fuel in Tinning

Producer Gas Equipment Reduces Tin House Fuel Consumption, Improves Quality and Increases Output

BY ROGERS A. FISKE*

DECREASE in fuel consumption for tinning to an equivalent of 3.52 lb. of coal per base box of tin plate was effected through producer gas equipment recently installed at the Canonsburg, Pa., plant of the Standard Tin Plate Co., a subsidiary of the Continental Can Co., New York.

The gas producer plant was so designed as to be at once flexible in its operation and economical in over-all fuel consumption, and at the same time to assure an increased quantity and better quality in tin plate output. Natural gas had been used and proved highly desirable except for its limited supply. Various methods of direct coal burning had been tried and found wanting, both from the standpoint of economy in fuel consumption and definite control of furnace heat. In view of the demonstrated superiority of gas, it was but natural that it should again be used despite the necessity of manufacturing it.

The coal available for gas production is of the ordinary run of mine as obtained in the Pittsburgh district and such as the company had been using for some time in the boiler plant. The normal supply all comes from one mine and the quality is therefore uniform. It yields an average of about 14,000 B.t.u. per lb. as received.

One engineering phase of the problem was to make available, so far as possible, the coal handling installation which already served the boiler house. This consisted of a track hopper, an inclined belt conveyor discharging coal to a crusher near the ground level, and a long inclined belt conveyor extending from the crusher to the boiler house bunkers.

Advantage was taken of this situation by laying out the gas generating plant to have the long belt conveyor between the producer and cleaning buildings and thus make the old coal handling equipment serve the gas plant as well as the boiler house. Accordingly two

producers were located north of the conveyor and the gas cleaning house was placed to the south. To make room for the new gas plant it was merely necessary to tear down a small pipe shed.

Only Coarse Coal Used in Producers

Coal is now unloaded into the track hopper, crushed and plowed off the long belt at a point about midway between the producers and at a height of 60 ft. above the yard level. It is spouted down to an automatic skip hoist loader which is below the yard level so that it can be filled by truck should occasion demand. The skip hoist, motor-operated and of the unbalanced type, elevates coal to the skip house head, where it is automatically dumped into a steel plate hopper which is provided with a feeder. The coal then passes over a disk-type grizzly. The fine coal passes through and is spouted back to the belt for delivery to the boiler house bunkers. The coarse coal is carried over the grizzly and is spouted two ways to two automatic weighing machines, furnished by the Richardson Scale Co., Passaic, N. J. It is then dropped into passageways known as retarders. These are essentially elongated steel boxes set up on end and provided with a series of inclined baffles. They serve the purpose of retarding the downward velocity and thereby reduce the momentum of the coal in its descent to the gas producer bunkers below.

The reason for this precaution is that the final cleanliness of the gas and tar is somewhat dependent upon the initial condition and form of the coal fed to the producers. Therefore, after once having separated out the fines, it is highly desirable to avoid producing



more fines in subsequent handling of the fuel. Each of the retarders unloads into a 120-ton self-trimming, Gunite-lined steel bunker, which feeds the coal by gravity to the gas producers. The new coal handling equipment and structural material were furnished by Phillips, Lang & Co., 431 South Dearborn Street, Chicago.

Ash handling is effected very simply by means of an industrial car, loaded by hand and moved on a monorail which terminates at the boiler house ash skip hoist.

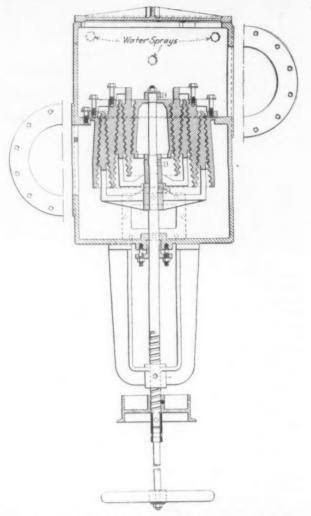
The gas generating equipment comprises two full mechanical gas producers furnished by Wellman-Seaver-Morgan Co., Cleveland. These are placed on a line parallel to the coal conveyor and are housed in a steel and brick building. The coal bunkers are directly overhead and are so designed that there is an open space between the building walls and the vertical sides of the bunkers. Several trap doors bridge this gap and serve as a seal to prevent coal dust from entering the producer room. When coal is not being discharged into the bunkers these trap doors are opened and thus provide ventilation over the gas producers. It is noticeable that space was not wasted and still there is ample room for operators to move freely about all parts of the equipment.

Low Velocities Provided in Gas Flues

Raw gas is taken from the top of each producer through a 4-ft. fire brick-lined, steel flue. The flue first turns at right angles and then downward at an angle of about 45 deg. to the base of a tangential type dust catcher. The downcomers are each 4 ft. in diameter, and the dust catcher is 8 ft. in diameter. The gas passes upward in the catchers to a main flue, which is horizontal and 6 ft. in diameter. The east end of this flue is connected to the upper end of a downcomer which joins the base of a burn-out stack. The stack also acts as a dust catcher. The gas passes up and leaves the burn-out stack just below the burn-out valve; it then travels horizontally, and after making two right-angle turns enters the bottom of a cooler.

All gas flues up to the cooler are steel and are lined with fire brick. The flues were designed to maintain a low gas velocity with frequent changes in the direction of flow, in order to trap a maximum amount of dust before the gas reaches the cooler. Adequate clean-out doors and burn-out valves are used so that it is practicable to operate either or both of the producers as occasion demands.

The cooler consists of a cylindrical steel tank through which the gas passes, intermingling with water



The Tar Extractors Are Made with Five Concentric Gas Passages. Raw gas enters above the plug and is drawn through the extractor by the exhauster suction

sprays, until its temperature is reduced to the required point for entering tar extractors. In the cooler, much of the soot, dust and heavy tars are separated from the gas as it passes upward. Water is required in the cooler, the tar extractors and a final scrubber, the amount used being about 3 gal. per lb. of coal gasified.



Four Batteries of Tar Extractors Were Installed. Only three are required to operate the plant at capacity

Water from the final scrubber is recovered and used in the cooler.

From the cooler the gas passes into a manifold header supplying the tar extractors. Specially constructed hot gas valves are used for cutting in and out the tar extractors.

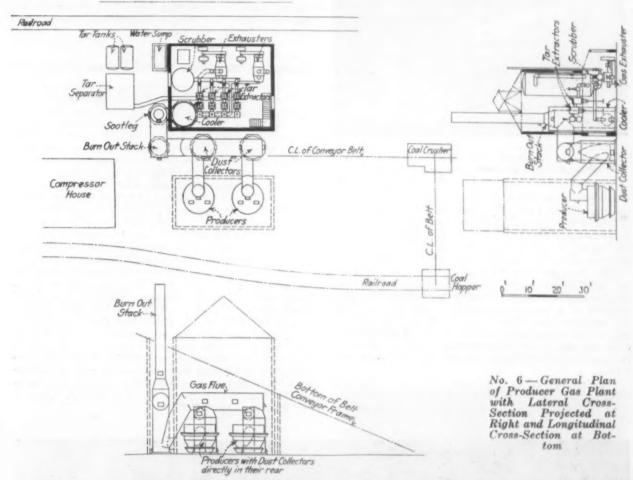
A Flinn & Dreffein type of tar extractor (patented) is used. It operates on the impact principle. It consists of a tapered plug, heavily threaded, fitted into a female similarly threaded. The plug is mounted on a vertical shaft, which has a thread the same pitch as the plug. The threaded part of the shaft passes through an outside yoke. The plug may be screwed up or down and remains in mesh with the female thread, but not in contact with it. The width of the passages, or chan-

object of the scrubber is further to cool the producer gas and remove the remaining dust particles that it may contain.

Gas Leaks Are Guarded Against

Gas leaves the top of the final scrubber, passes to two Wilbraham-Green Blower Co. (Pottstown, Pa.) exhausters, which are motor-driven through Lenix drives made by F. L. Smidth & Co., 50 Church Street, New York. Either blower will operate the plant at full capacity. It should be noted that the entire cleaning plant is on the suction side of the exhausters. This is an assurance that no outward gas leaks will develop in any of the apparatus and thus the cleaning house is made a desirable place in which to work. Forty-

MILL BUILDING



nels, between the threads is varied through changing the position of the plug. Tar-laden gas enters the tar extractor above the plug and is drawn through by means of the suction produced by the gas exhauster. In the upper chamber of the extractor, above the plug, are water sprays. Water is used to further cool the gas and also to act as a vehicle for maintaining the flow of tar and soot removed from the gas.

The position of the plug is determined by the drop in pressure necessary to overcome resistance resulting from the restricted passages, this resistance being indicated by a differential gage. An average drop in pressure of approximately 1 lb. is carried, thereby setting up a gas velocity greater than 2 miles per min. At this exceedingly high velocity, the small particles of tar strike against the threads, and form a thin film of liquid tar, which results in a stream that is drained off from the bottom of the extractors. Wherever there is a thread, the gas must change its direction and the tar particles strike the metal surfaces with great force. At each thread, the gas changes its direction two times, so that in a tar extractor having a plug of 10 threads, there are 20 impacts. A feature of the extractor is that it can be adjusted to maintain a constant cleaning effect for all loads.

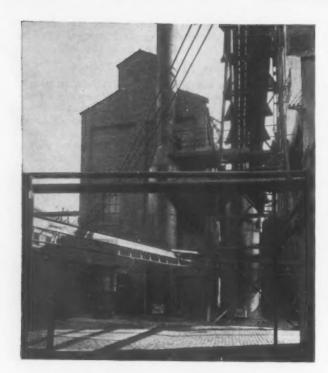
The scrubber is a cylindrical steel tank fitted with board checker work and provided with sprinklers. The four horsepower are required for handling the gas from one ton of coal.

Piping is all standard weight steel, except in the larger sizes, which are of the spiral riveted type. All fittings and valves are iron and were furnished by the Crane Co., 836 South Michigan Avenue, Chicago, and the Ludlow Valve Mfg. Co., Troy, N. Y.

It is important to maintain a constant pressure at all loads on the gas lines to the burners. This is accomplished by a relief valve on the delivery side of the exhausters, effecting a by-pass to the base of the cooler, thus recirculating some of the gas through the cleaning plant.

All water and tar drains are connected with seals which overflow into trenches. The termination of the main trench is at a baffle type tar separator from which the water passes to the sewer and the tar flows to a tar tank which is intermittently placed under steam pressure to force the tar to burners provided in the boiler furnace walls.

Tar recovery amounts to 15 gal. per ton of coal gasified and the B.t.u. value of a gallon of tar is approximately 120,000. The conversion efficiency of the gas plant is about 72 per cent. This, however, is an apparent efficiency, because allowance must be made for the tar recovered and burned at the boilers. The ultimate clean producer gas contains about 10,800



Ashes Are Conveyed on a Monorail which Terminates at the Boiler House Ash Skip Hoist

B.t.u. per lb. of 14,000 B.t.u. coal gasified in the producers. Out of 1 net ton of coal, 28 per cent, or 560 lb., is lost in the process. Recovery by tar return is equivalent to about 128 lb. of coal per ton gasified; therefore the net loss is only 432 lb., or 22 per cent. This means an over-all conversion efficiency of 78 per cent.

Gas from the producer plant is used in the tin house for heating automatic tinning machines, which were supplied by the Aetna Foundry & Machine Co. Two burners of a special air-inductive type are provided for each machine. One burner is on the oil side and one on the metal side. Gas is delivered under about 1 lb. pressure. Air proportioning is automatic and is designed to provide the proper mixture under all conditions.

Tinning operations are begun early every Monday morning and are run continuously until the end of the week. The pots are kept warm over the week end by natural gas flames, while the gas producers are banked and the flues burned out. Sunday noon the producers are again brought in and the gas is fired on the oil side. By this method the pots are brought up to working temperature and the producer gas flame on the metal side is not turned on until actual tinning operations begin early Monday morning. The same burners are used for either natural or producer gas.

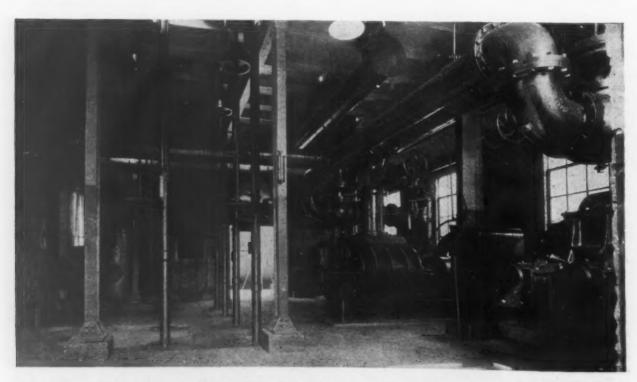
As a result of increased production, brought about largely by improved furnace operation, 10 more hot mills can be installed before it will be necessary to increase the capacity of the present tin house. Data gathered over a five weeks' period show that 3.52 lb. of coal is required per base box of tin plate. This figure is corrected to include the natural gas used in keeping the post pots warm over the week end.

The Flinn & Dreffein Co., 431 South Dearborn Street, Chicago, contracting engineer, designed the entire gas plant and burner system and specified the equipment which was installed.

Sales Conference of Steel Fabric Company

The annual sales conference of the National Steel Fabric Co. will be held at the Pittsburgh Athletic Association, Pittsburgh, Dec. 14 to 18, inclusive. The opening address of the meeting, which will bring together 65 branch managers and salesmen of the company, will be by Homer D. Williams, president of the company, and for the evening meeting Monday evening, Dec. 14, the principal speaker will be Charles Coolidge Parlin, manager research department Curtis Publishing Co., who will talk on "Economic Distribution." On Tuesday, W. E. Hart, manager structural bureau, Portland Cement Association, Chicago, will present a paper on "Portland Cement Stucco." Another speaker for the second day's session is L. Brandt, Pittsburgh, who will talk on "Engineering Service for Housing Projects."

The results of the Highway Research Council investigations will be presented on Wednesday by C. A. Hogentogler, Highway Research Council Committee, Washington. Thursday will be devoted to an inspection of the mills of the Pittsburgh Steel Co. and its subsidiaries, and the annual banquet will be held in the evening. On the last day of the meeting there will be papers and discussions on reinforced concrete pipe and fabric in building slab construction and an address by John D. Baker, president Baker-Holmes Co., Jacksonville, Fla., who will talk on "The Dealer's View of the Manufacturer."



The Cleaning Plant Is on the Suction Side of the Exhausters, a Location which Protects it from Gas Leaks

Economy in Materials Handling

Savings Effected by Mechanical Methods—Determination of Most Suitable Carrier—Application of Guards for Accident Prevention

HE selection of a mechanical conveyor or carrier depends upon individual plant conditions and cannot be determined by hard and fast rules, said F. D. Campbell, consulting engineer, New York, in his paper presented before the materials handling section of the A. S. M. E. in New York, Dec. 2. The unit of material handled and the frequency with which each unit must be moved will be determined by the quantities used in each step of the productive process, he pointed out.

"The most suitable carrier can be determined by considering fixed charges against a conveyor system to

ACCIDENT FREQUENCY = NUMBER OF ACCIDENTS PER

100 EMPLOYEES PER YEAR

NOTE: - INCLUDES ONLY ACCIDENTS CAUSING LOSS OF TIME IN

ANY DAY OTHER THAN THE DAY OF MAJURY.

MO. OF EMPLOYEES IS ON YEARLY BASIS-1 e.- TOTAL MAN-HOURS WORKED+24

EN EGILEO 15 OF	TEARLI DADIS-18 TOTAL MAN-	HOURS WORKED + 2,400
YEARS	ACCIDENT FREQUENCY 9.9 (238 ÷ 24 04)	PER CENT REDUCTION
JAN. 1,15 - DEC. 31,15		1
JAN. 1,16-DEC 31,16	9.3 (302 ÷ 32.48)	6
UAN. 1,17- DEC. 31,17	3.7 (147 ÷ 39 97)	63.
JAN. 1,18- DEC. 31,18	20 (80 - 394)	80
JAN. 1,19- DEC. 31,19	1.4 (46 ÷ 31.71)	
JAN. 1,20- DEC 31,20	1.2 (42 - 36.39)	86
	1.5 (33 ÷ 22.32)	88
JAH. 1,21 - DEC.31,21	1.0 (31 + 31.24)	85
JAN. 1,22- DEC. 31,22	10/31 - 3100	90
JAH. 1,23- DEC. 31,23		90
JAN. 1,24 - DEC. 31,24	1.1 (34 ÷ 30.92)	89

QUARTERS	
JAN. 1,25-MAR 31,25 22	(12×4+21.39) . 78
APR. 1,25- JUN 30,25 0.9	(6×4+2802)

Variation in Accident Frequency in a Steel Mill. Improvement in materials-handling accidents has played an important part in the average reduction of more than 85 per cent which has been maintained by a steel plant employing about 3000 men, the record of which, for the past seven years, appears in this figure. This accident reduction has resulted from increased mechanical handling of materials as well as from mechanical guarding and improved practices resulting from closer safety supervision

reach all desired points in comparison with the cost of labor necessary to accompany the unit truck load plus truck-equipment fixed charges. The required movement in quantity, frequency and distance will determine the total truck and labor outlay. The same line of thought will determine general interdepartment handling where the departments are impossible of relation to each other because of peculiarities of premises or product.

Method of Figuring Charges

"For movement through process, one operation should be made as nearly as possible to the preceding one. This should be the case in effect, if not in reality, and the line principle can be achieved in effect by mechanical means. In the flow of products, if the continuous type of conveyor be used, varying distances are of no consequence as the arrivals equal the departures, there being on the line as many units as are necessary for the frequency, speed and distance. These lines will also act as magazines to provide flexibility in flow and will as a rule constitute the 'stock in process' storage. "Processing points should be arranged in their

proper order in the fabrication of the product, concentrated to eliminate unnecessary motion, and placed in practical proximity to the carrier. Wherever possible the carrier should be the sole support of the material moved, serving as the work bench and obviating removal of material from it.

"After a plan for arrangement and operation has been plotted out and the requisite equipment to carry the production has been fitted to it, the total approximate cost for changes, fixtures, equipment, etc., should be estimated in order to provide a working basis for assigning fixed charges. This total should carry a normal item for depreciation of 10 per cent, interest charges of 6 per cent, insurance costs, the cost of power required at prevailing rates, wages necessary for operation of system as an operation charge, and an item of from 1 to 1.5 per cent for maintenance, repairs, lubricants, and incidental items. As an offset to this total, any or all of the following may be classed as benefits; direct labor reduction in handling, time losses waiting for materials or other delays, productive earning of floor space saved (approximately 10 per cent of the value of products at factory cost, apportioned on the basis of the total output to the total floor space), 6 per cent of inventory reduced, time losses in delays (elevator waits, congestion, and other causes), and the monetary value of a more rapid turnover or shorter manufacturing period. The difference between these two totals represents the possible earnings on the pro-

Discussion of this paper brought out the advisability of consulting a competent engineer if there is any question as to the recommendations of an individual salesman for conveying equipment, the necessity of



Tender with Steps and Guard Rails for Use of Narrow-Gage Yard Switching

separating materials-handling from process work in cost accounting methods and the comparatively small number of plants which are even reasonbly equipped for efficient moving of materials today.

Safety Suggestions

David S. Beyer, vice-president and chief engineer, Liberty Mutual Insurance Co., Boston, illustrated his talk on safety methods in material handling with a number of slides, reproductions of which appear on these pages. After demonstrating the seriousness of the materials handling accident by showing that accidents attributable to such causes form about one-third of all industrial casualties, he estimated the annual economic loss to the country at approximately \$250,000,000. He listed the chief sources of material handling hazards as follows, in order of their contribution to the accident record of the State of Massachusetts for a certain period: elevators and construction hoists,



An Employee Was Caught by a Cave-in at the Point Where the Man Is Standing in the Picture, Thrown Against One of the Wheelbarrows and Injured so Badly that He Died Within a Few Hours. While the ore pile was undermined somewhat, it was only about 8 ft. high at the point where the accident occurred

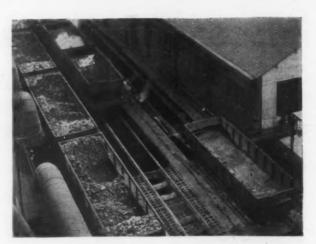
cranes (including locomotive and jib types) and derricks, conveyors, and plant trucks on tracks.

ricks, conveyors, and plant trucks on tracks.

Inclosure of shaftways, provision for adequate gates, proper inclosure of the car itself, cable guards, bevel plates at floors, automatic interlocking gates, and proper protection from moving belts and pulleys were some of the suggestions made in connection with hoists and elevators. Complete footwalks and working platforms with standard railings and toe-boards on the crane bridge, convenient access to the crane (preferably by railed stairways and walks rather than vertical ladders), adequate braking arrangements, dependable hoist-limit stops, use of cables in preference to chains for hoisting and use of bumpers and wheel guards for bridge and trolley were suggestions for decreasing crane and derrick hazards.

Guards for gearing, sprockets, belting and shafting should prevent many of the moving conveyor accidents, said Mr. Beyer. The use of safety couplers was advocated as a means of cutting down accidents in railroad yards and on switching operations.

An important point brought out during the discussion of this paper was the need for comparable data in regard to the best methods for preventing accidents. Data from individual plants may be available, but it is seldom comparable with other plants, and State records are of little value in determining what can be done to lower the number of industrial accidents. In many in-



Ore and Coke Trestles Provided with Grille Work Underneath Car Tracks, to Prevent Persons Falling Through Dump Cars with Material and Being Suffocated in the Bins Below

dustries as much as one to two per cent of the payroll is represented by the accident total and the need for more data is pressing.

Report on Progress

The progress report of the executive committe of the Materials Handling Division of the A.S. M. E. was read by the chairman, James A. Shepard, Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., and said, in part:

As our industries are now organized, an inventory of the handling operations requisite for the production of almost any item of manufacture, covering all stages from the point of origin until it finally reaches the ultimate consumer, will usually mount to an almost unbelievable total. In a study of the handling operations involved in the production of iron castings in the foundry, conducted by Max Sklovsky, chief engineer Deere & Co., Moline, Ill., it was found that, on the average, for each ton of finished castings produced, 168 tons of materials of one sort or another were required to be handled. Extending the survey to cover the handling operations involved in the production and transportation of the basic materials employed in making the castings, their subsequent machining and assembly with other materials into one of the products of the metal trades, such as an automobile or agricultural implement, according to conventional manufacturing methods, it is estimated that a grand total of 224 tons of materials is handled for each ton of finished product delivered to the ultimate consumer.

(Concluded on page 1712)



A Well-Guarded Traveling Crane, With Complete Inclosure of Gearing, Shafting, Couplings, Electrical Equipment, etc., and Fenders in Front of Trolley Wheels

Open-Hearth Boils of High Vigor

Decarburizing Effects and the Talbot Reaction— Effervescing Steels—Martin and Siemens Processes

BY HENRY D. HIBBARD*

VIGOROUS boiling, being essential to the rapid decarburization of the bath, is covered in this section. Too strong for high-carbon or medium-carbon steels, the brisk or strong boil designed for finishing low-carbon or effervescing steels nevertheless has a large place in the modern open-hearth process. It is this type of boil which is considered in the following paragraphs.

6-Brisk Boil

A brisk boil is one of the useful decarburizing boils. It is too strong a finishing boil for any except low-carbon effervescing steels containing say from 0.15 to 0.18 per cent of that element. Such steel may properly have a brisk boil at the end before the addition of ferromanganese, or before tapping when the manganese is added in the ladle.

A brisk boil is too active for steel which is to be killed, or even partly killed, to have at the end for, while enough silicon or titanium or aluminum may be added to prevent any escape of gas from the metal in the mold, the unfinished steel will contain too much oxide of iron, which will react with the solidifying elements and form undue quantities of sonims, too many of which will, by remaining in the steel, damage its quality.

7-Strong Boil

A strong boil is an active decarburizing boil and, in many shops, is not intentionally exceeded in violence, whether quality or "tonnage" steels are being made. It is far too strong at or near the end of the heat for steel which is to be killed or even partly killed. Some makers of effervescing steel, to contain when finished around 0.18 to 0.20 per cent of carbon, aim at a strong boil before tapping, or before adding ferromanganese when that is done in the furnace.

Such a boil is, however, too strong even for such steel, for the effervescence in the molds is likely to be too vigorous, so that the steel tends to settle in the molds as it freezes. To prevent such settling, aluminum is added, either in the ladle or mold, say from 2 to 5 oz. per ton of steel, which will, when in proper amount, check the effervescence so that the ingots will rim in level and have flat tops. Such a procedure, making the boil too strong and then checking it, seems like wasting aluminum, though it may save some time and may make the steel freer of skin-hole gas.

8 and 9-Jet Boil and Strong Jet Boil

These unusual boils occur only during decarburization. They come from what would ordinarily be considered too plentiful additions of ore, made in an attempt to drive the furnace faster. A charge fairly high in carbon, say with over 0.4 per cent, with these boils is in danger of rising and flowing out of the furnace doors. To prevent this it needs to be banked up with bottom material.

When these boils occur it is customary to withhold further ore additions until the bath has quieted somewhat, say to a strong boil, which will usually take but a few minutes. They are never finishing boils.

10-Talbot Reaction

This reaction is given to hasten to the maximum rate possible the oxidation of the silicon and carbon

of the metal. It does this even more rapidly than the Bessemer converter, though not so completely as regards carbon. A newly added quantity of molten crude iron, amounting perhaps to one-fifth of the whole charge, is so refined in 1 or 2 min. The bath metal has a negligible percentage of carbon before the crude iron is added so that, with the crude intermixed, it contains about 0.7 per cent of that element, as well as 0.2 per cent of silicon.

The quantity of oxide of iron to furnish the oxygen needed for combining with these elements, already charged into the furnace, is melted and incorporated in the slag. The time of the reaction is therefore short for, though the metal and slag are immiscible, the area of contact between them along which the reaction takes place is enormously increased by the agitation caused by the escape from the metal of great quantities of gas. The silicon is oxidized almost at once and more than half of the carbon goes during the reaction, after which the bath settles down to a strong boil, which continues with diminishing activity until the carbon is eliminated to the desired extent.

Sometimes the reaction does not start at once after a batch of crude iron is added, in which case, assuming the presence of sufficient oxide of iron in the slag, it may be started by stirring the bath with a rod, which increases locally the area of contact of slag and metal and so starts the rapid oxidation of the carbon. The reaction will then be continued by its own agitation. At times the formation of gas is so rapid as to be almost explosive, even so as to blow a hole in the furnace roof, necessitating a shutdown for repairs.

Quasi-Talbot Reaction

This sometimes occurs in a medium or high-carbon heat and is a rather sudden, energetic evolution of gas, which raises the slag so that it flows copiously out of the furnace doors onto the charging floor. Conditions tending to cause this are unduly low bath temperature and, sometimes, high silicon in the crude iron.

Decarburizing Boils

All the boils after No. 5 are transitional and, except sometimes in the case of strong boil (No. 6), referred to later, should always be succeeded by a quieter, settled boil before the final additions are made, either in furnace or ladle, whatever kind of steel is being made.

Pig-and-Scrap, or Martin Steel

This method of steel-making is seldom if ever employed now. It may be carried out, preferably on an acid hearth, which enables the carbon to be controlled better than when the hearth is basic. Early in the development of the open-hearth process, when the furnace bottom was always acid, it was customary to melt first a part of the charge—about two-thirds, including all the pig iron—and then to dilute the carbon in the metal by adding preheated low-carbon material, usually wrought from.

Unless the bath was dead, as already noted, some carbon was of course oxidized during the operation, by the oxide of iron formed during melting down, and some boil was thereby occasioned. Boils occurring in making steel by this method may vary from none at all to perhaps moderate. The more active boils do not occur.

Excess of Pig, or Quasi-Siemens Steel

The great bulk of open-hearth steel is made by this method, with an excess of crude iron in the charge;

^{*}Consulting metallurgical engineer, Plainfield, N. J. This is the third or concluding section of an article on Open-Hearth Boils. The two other portions appeared at page 1511 of the Dec. 3 issue and page 1605 of the Dec. 16 issue.

that is, enough so that when first wholly melted there is in the metal an excess of carbon beyond that desired in the finished steel, which excess must be eliminated. The boil to accomplish this may at first be gentle or moderate, according to the content of residual silicon or the percentage of iron oxide in the slag. It will then increase in activity as ore is added, to any degree, even to the jet boils, and then subside to the proper boil for finishing when the bath is allowed to stand molten without further additions of ore. Heats so made are styled "trade" heats, by Camp and Francis.

Pig-and-Ore, or Siemens Steel

When steel is made by this method without any scrap in the charge (now seldom employed) the greatest variations in boil occur. The bath is likely to lie perfectly dead at first, no boil appearing until the silicon in the metal has been eliminated by oxidation to less than 0.2 or 0.3 per cent. With further additions of ore the boil may increase in vigor, possibly to the jet boils. It will (or should) subside, as the desired content of carbon is approached, to gentle (No. 4) or moderate (No. 5) or brisk (No. 6), according to requirements, as noted later. The extreme case of boil (the Talbot reaction, No. 10) is a pig and ore boil.

Killed Steels

The boil of a charge of steel intended to be killed, made by the excess-of-pig method, which it usually is, may be of any degree during decarburization, increasing (say) from gentle to strong. But at the end, before any of the final additions are made, it should be quieted down again to about incipient (No. 3), or gentle (No. 4) in the way already noted, to insure that oxides in the metal and slag are not present in greater than controllable amounts. If the finishing boil be stronger, an undue amount of the silicon added to kill the metal will be oxidized, and form so great a number of sonims that many may not be eliminated but remain in the steel in harmful amount, to the injury of its quality. Or, with too strong a boil, the steel may be only partly killed by the usual addition of gas solvents.

When hard basic steel is being made, such as spring steel to finish with 0.85 per cent of carbon, and the bath has a strong boil, no further addition of ore will ordinarily be needed after the carbon content has fallen to 1.2 per cent. There will be enough oxide of iron in the furnace, principally in the slag, if enough time is allowed, to bring the carbon percentage to that desired. The boil will gradually slacken in vigor to gentle, while the 0.35 per cent of excess carbon is being eliminated. If the steel is to be of a medium grade, to have when finished 0.5 per cent of carbon, and the boil is strong, no ore will be needed after the carbon content has fallen to 0.7 per cent. Other grades act correspondingly.

Partly-Killed Steels

The boil of medium or hard steel which is intended to be partly killed may of course be more vigorous than for killed steel during decarburization, as well as

at the end, but at some expense of quality, though it may result in some saving of time. The finishing boil may be moderate (No. 4) or even brisk (No. 5), depending on how clean the steel must be and how free the ingot of gasholes. The stronger the final boil, the more gas-solvent is needed for a given degree of solidity.

The great variety of partly-killed steels precludes laying down rules, as each variety calls for its own method. If the steel must be free from skinholes its boil should not be stronger than moderate, when the first of the final additions is made. Partly-killed steels (medium or hard) nearly always have gasholes, more or less numerous, in the upper central parts near the pipe. If these cannot be permitted, the final boil must be gentle or moderate and the addition of silicon or other gas-solvent ample, as previously stated.

Effervescing Steels

The boil for steels intended to effervesce in the mold may be any of the decarburizing boils—No. 6 or above—while the excess of carbon is being eliminated. At the end it must be more active than when the steel is to be wholly or even partly killed. The proper boil just before the first of the final ferromanganese is added, or just before tapping when that is added in the ladle, varies with the carbon content. The lower the carbon, the milder the boil, somewhat according to Table I, which assumes the concentration of oxide of iron in the slag to be the same in all the cases given.

Table I

Carbon in Metal

0.20 per cent
0.15 per cent
0.10 per cent
0.00 per cent

There will never be any silicon in basic effervescing steel unless some has just been added. What is so reported by the chemist is undoubtedly in the form of oxide or as silicate. Manganese in common practice is always present in the unfinished steel and has some quieting effect on the boil. With 0.15 per cent of carbon, the manganese content in the unfinished steel should be under 0.10 per cent, lest the boil and effervescence be too mild. To keep up a proper boil, moderate ore additions to the bath will usually be required to be continued until taking the last or "go-ahead" sample.

When the boil has been suitable and strong enough, skinholes may not start to form in the ingot until ½ in. or more of the ingot-wall has frozen. Then, with proper effervescence, the skin-hole bubbles may all be dislodged and carried away except across the bottom of the ingot and, possibly, a few inches up each side. When heating for rolling is done with ordinary care, with moderately good gas, holes ½ in. in will not be burnt into, as will those of "thin-skinned" ingots, which form well-known defects. Steel which boils in the ladle moderately may effervesce fairly well in the mold.

The boils herein considered are those of ordinary

The boils herein considered are those of ordinary methods and do not include those in which the slag is run off the bath and a new slag made.

Favors Importing Labor When Needed— Immigration Under the New Law

Washington, Dec. 15.—Secretary of Labor James J. Davis, in his annual report for the fiscal year 1925, repeats a previous recommendation that Congress give the President authority by proclamation to suspend immigration to the extent necessary, when the Secretary of Labor and the Secretary of Commerce jointly certify that in their opinion unemployment in the United States requires such a step. At the same time, the Secretary of Labor also recommends that provision be made for importing labor within the quota when skilled or unskilled workmen are needed for permanent employment, and no strike or lockout exists or impends in industry needing the labor.

This form of importation would be made upon special immigration certificates issued at the direction of the secretary after hearings and an investigation to

ascertain the conditions under which it is sought to bring labor into the United States.

The secretary's report also shows the extent to which immigration countries used their quotas during the year ended June 30, 1925, the first year under the immigration act of 1924, which limits the number of immigrants of any nationality to 2 per cent of the number of residents of that nationality in the United States, according to the census of 1890.

Most of the countries specified filled their quotas. Among those nations which did not send to the United States as many immigrants as they were entitled to under the law, were Italy, which used about 70 per cent of its allotment; Hungary, which used approximately 75 per cent; and Armenia, less than 50 per cent. Czechoslovakia used 96 per cent, and Jugoslavia used about 80 per cent of the quota assigned to it. The use of quotas is measured by the visas granted and not by the number of actual demands.

Machine Repairs Furnace Slag Lines

Dolomite Is Mechanically Thrown Against Open-Hearth Walls—Control Carries
Stream to Sides of Furnace

A MACHINE to repair slag lines in open-hearth furnaces has long been recognized as a pressing need, as the manual method is very unsatisfactory, requiring too much time and forming a particularly arduous task for the men. Such a device is now available and has been in successful operation under practical conditions for over six months. Not only does it place the material on the slag line in a much shorter time and with only one operator, but it also fulfills other conditions imposed upon equipment of this nature. No water or air is required for its operation; the plugging in on an electric socket is all that is required to make the machine ready for use. The machine is self-contained,

Driving Dolomite Hopper Pulley Groove

Belf Rocker Discharge Pulley

Vertical CrossSection Showing
How Dolomite Is
Dropped Into the
Groove of the
Large Central
Pulley and Carried Around by
Continuous Belt
to the Point of
Discharge

transported on wheels either on the charging track or on the floor itself, and works independently of the crane.

In the operation of the machine, which is being marketed by the Blaw-Knox Co., Pittsburgh, the dolomite is fed from an overhead hopper large enough to hold material sufficient for two furnaces. From the hopper the dolomite falls through a cone-shaped chute into the groove of an 18-in. pulley which revolves in the direction shown by the arrow in the drawing. Besides this grooved wheel the throwing mechanism consists of three smaller pulleys and an endless rubber belt. Where the belt covers the groove the dolomite is thrown on it by centrifugal force and is made to assume its velocity. Where the belt bends over the "dis-

charge pulley," the material will leave the machine in a solid stream.

The top pulley is mounted on the shaft of a 2½-hp. variable-speed motor, which furnishes all the power required. The discharge pulley is mounted on a rocker arm, as shown in the diagram. This allows an up and down movement controlling the direction and range of the stream in a vertical plane.

The throwing mechanism with its four pulleys, and the electric motor are mounted so as to allow turning around a vertical axis. This gives horizontal control of the stream. Both the vertical and the horizontal movements are controlled from the same handle at which the operator is seen in the illustration. This handle also controls the flow of material into the groove, being connected with a shutter placed in the chute, as shown in the other photograph. Ball and roller bearings throughout assure easy operation, with little effort on the part of the operator.

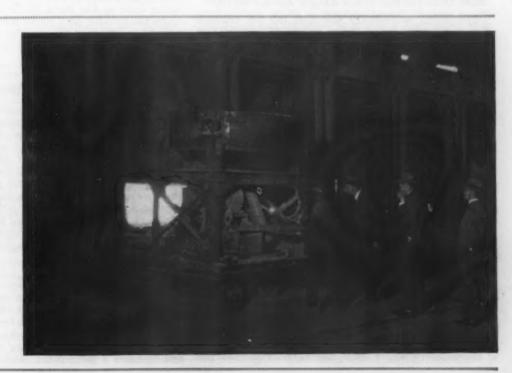
The machine is built sturdily to withstand the heavy service to which steel plant equipment is subjected. Even the belt promises to give surprisingly long service; in fact, six months of operation has not been sufficient time to indicate what may be expected. The heat from the furnace does not affect the belt, as by its movement it keeps cool enough to be touched by the hand even after extended periods of operation.

In actual service the time required for making the back wall depends, of course, on the amount of material needed in each particular case. The whole operation, however, seldom requires more than from 4 to 5 min. In a 100-ton furnace with five doors, it is only necessary to open the middle and the two end doors, as the range of the machine is great enough to throw the material from the two end doors to a point very nearly opposite the middle door.

The material does not scatter when it reaches the back wall. The machine is so designed that the shape of the stream is the same as the trajectory of a charge sent from a shovel. In reaching the back wall it will therefore behave in exactly the same manner as when shoveled into the furnace. The capacity of the machine is approximately 1 ton per min., and it will handle single burnt, double burnt and raw dolomite.

The machine is fool-proof in its operation and can

A Dolomite Machine in Operation. By means of the handle, in the hands of the operator, the stream may be swung through both horizontal and vertical planes





The Discharge
Side of the Machine Exposed.
The flow of material from the
hopper is controlled by the operating handle,
which is connected with a
shutter placed in
the chute

be handled by any man in the plant after a few minutes instruction. The operator, usually the first helper on each furnace, stands about 8 or 9 ft. away from the door and is well shielded by the machine itself. In fact, it is feasible to make the back wall when the heat is being tapped. The front wall can be made by deflecting the stream from a spoon, slightly bigger but of the same shape as that used for the present manual operation.

The method of transporting the machine around the open-hearth floor will vary with the conditions existing in each individual plant. In one illustration it is shown coupled to a Clark truck tractor in a way which has proved to make handling very easy and convenient. But the small wheels and the rubber tires shown on he photograph make this construction possible only in plants where the floor is in very good shape. Bigger wheels and steel tires, or possibly a tractor of the caterpillar type, will probably be more suitable for the floors to be found in the average plant. The machine can also be mounted on flanged wheels and placed on the charging tracks in plants where the position of the cross-overs and other switching conditions makes this solution possible.

The width of large open-hearth furnaces is limited largely by the distance the furnace men can throw in patching the back wall. The substitution of mechanical for manual patching may tend toward the design of wider hearths and better proportion of width to

length than exists at present.

Electric Hoist with High Lift Feature

Simplicity, accessibility and high lift are features of a new electric hoist, known as the "Standardt-ized Hi-Lift," which is being added to the line of the Northern Engineering Works, Detroit. The design permits application of any standard make of motor, which is a feature stressed by the maker as outstanding.

The design of the new machine follows that of the company's 5-ton "Standart-ized" crane. Gears are of hammered steel, case hardened, are entirely inclosed and run in oil. The drum is of the grooved type and of large diameter. The hoist is provided with two brakes for holding and controlling the load, and a top and bottom limit stop. Roller bearings are used throughout.

Niles-Bement-Pond Co. Sells Pond Works

The Niles-Bement-Pond Co., 111 Broadway, New York, announces the sale of its Pond Works, Plainfield, N. J., to the International Motor Co., Plainfield, which will utilize the plant for a service station and for the manufacture of parts of obsolete models of Mack trucks. The Pond Works consists of a machine shop, forge shop, foundry, pattern shop, storage buildings and an office building, consisting of seven or eight separate structures.

The International Motor Co. will take possession of the property May 1, 1926, and before that time the

Niles-Bement-Pond Co. will complete the work now being done at the Pond Works and then will concentrate the greater part of its manufacturing at Hamilton, Ohio. Most of the machine tools and other equipment of the Pond Works will be offered for sale.

Nail Machines for Bethlehem Plant

New equipment to be installed in the Sparrows Point, Md., plant of the Bethlehem Steel Co., includes 124 Ryerson-Glader steel frame nail making machines and 16 Ryerson-Glader barbed wire machines

and 16 Ryerson-Glader barbed wire machines.

The nail machinery is of five different sizes for making nails of various dimensions. The capacities of these machines range from 225 to 550 nails per min. the average production of the entire 124 machines being rated at approximately 47,975 nails per min. Each of the 16 barbed wire machines has a capacity of 1000 tons and upward of barbed wire per month. Joseph T. Ryerson & Son, Inc., Chicago, will furnish the nail and the wire machinery.

Group insurance has been arranged for the employees by the Fort Pitt Steel Casting Co. of McKeesport, Pa. The insurance, underwritten by the Metropolitan Life Insurance Co., has been contracted for without restrictions as to age or physical condition and includes a permanent disability provision.

JIG BORING MACHINE

High Accuracy Claimed for Swiss Design—Center Punch Device Facilitates Operations

A HIGH-PRECISION locating and jig boring machine of larger capacity than its previous models has been developed by the Société Genevoise d'Instruments de Physique, Geneva, Switzerland, and is being placed on the American market by the R. Y. Ferner Co., Investment Building, Washington.

The machine, designated as the No. 6, and illustrated herewith, has a horizontal bed, with ways along which the work carriage is moved by an accurate lead-

There are screw. two uprights which carry a cross slide on which the tool holder is mounted, the tool holder being actuated by a second lead-screw. The errors of both of these leadscrews are automatically compen-sated by means of curved templets attached to the carriage. These templets are cut in ac-cordance with the measured errors of the lead-screws as mounted in place. A steel finger follows the contour of the templet as the table moves and, through a lever system, automatically shifts the vernier index of micrometer the head back and forth to correct the settings for small errors in the screw. The two lead-screws have a

pitch of five threads per inch, and have micrometer heads graduated to 0.0005 in. on which there are verniers to permit readings to 0.00005 in. The micrometer heads are protected from injury by shields.

The accuracy of the No. 6 machine is said to approximate closely that of the company's Nos. 4 and 5 machines, for which the guaranteed maximum errors of distance between axes of bored holes for full capacity of the machine are 0.0006 in. and 0.0008 in., respectively. The work-table measures 40 in. by 59 in. and has a longitudinal travel of 51 in. The transverse travel of the tool-slide is 40 in. The vertical travel of the cross rail is 30 in. and the maximum distance of the tool above the table is 33½ in. The distance between the uprights is 55 in.

Two drilling and boring spindles are mounted on the tool carriage, as shown, the larger one, for the main drilling and boring operations, being capable of drilling holes from % to 1% in. in diameter, or of boring holes up to 6 in. in diameter. The smaller spindle operates at high speed and is adapted for drill-

spindle operates at high speed and is adapted for drilling holes from 3/16 to % in. in diameter. The vertical movement of tools in the larger spindle is 10 in., and in the smaller 4 in. Automatic feed of both spindles is provided at four rates, 0.003 in., 0.005 in., 0.008 in. and 0.012 in. per revolution. The axes of the two spindles are at a fixed distance apart, so that the making of settings of one spindle relative to holes laid out with the other is simply a matter of adding or subtracting an integral number of inches to or from the reading of the zero reference point. Both spindles are controlled through a clutch coupling. Nine speeds

are provided for each spindle, those of the larger spindle ranging from 40 to 200 r.p.m., and those of the smaller from 200 to 1000 r.p.m.

Because of the length of travel and weight of the work table, provision has been made for power movement of the table over the major part of its travel. This mechanical drive of the table is controlled by a lever which stops the table automatically when the lever is not held out of its initial position. A 2½-hp. constant-speed motor is used to drive the machine.

Not only is it possible with this machine to lay out work in rectangular coördinates, starting from any one of the holes as a reference point, or from a machined edge of the work, or other zero point, but provision is made also for laying out points in polar co-

ördinates. For this purpose a 24-in. circular table is provided for at-tachment to the work-table. ters are provided for mounting in the spindle and in the center of the circular table, and a rotatable level for setting between them, so that the center of the circular table may be located accurately beneath the axis of the spindle. Provision is made for measuring rately the settings of the circular table and the machine is equipped with an adjustable indicating device which is mounted in the spindle of the machine for use in lining up or cen-tering work on the table. A microscope with "broken" tube also provided,

this being mounted in the spindle and used for checking purposes or for testing the present accuracy of an old job.

For laying out the work a semi-automatic centerpunch device, which is intended to be mounted in the spindle and has its point in accurate coincidence with the axis of the spindle, is available. By rotating a knurled ring against the action of a helical spring the point of the punch is raised, by means of a cam, until the compression is sufficient to give the desired punch mark, after which it is suddenly released to make the mark. The device is intended to permit all holes to be laid out rapidly, and then the drill inserted for drilling all of them, and finally the boring tool or end mill inserted for making the finishing cuts, without the necessity of making any check measurements during the process.

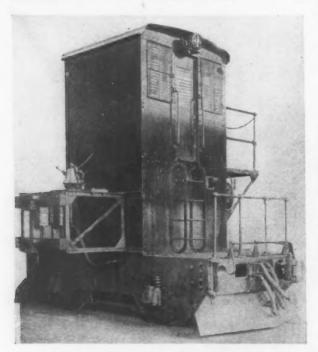
In addition to its use for jig and fixture work, the machine, it is said, may be employed to advantage in laying out and cutting profiling dies, punches, cams and special gages. The length of the machine is 126 in., the width, 100 in., and the height 124 in. When the table is in its extreme position the length of the machine is 146 in. The net weight is approximately

In Addition to Jig and Fixture Work, the Machine May Be Used For Laying Out and Cutting Profiling Dies, Punches, Cams and Gages

The Crusader Line Pipe Co. of Arkansas has ordered 24 pumping engines from the Wilson-Snyder Mfg. Co., Pittsburgh. These engines will be installed in eight pumping stations to serve a pipe line of 150 miles, running from El Dorado, Ark., to Monroe, La., on the Mississippi River. The pipe for this line will be furnished by the Youngstown Sheet & Tube Co.

Electric Locomotive for Coke Quenching Cars

The locomotive shown in the accompanying photograph has been developed for use in drawing coke quenching cars in the iron, steel and other industries where coke is made. It was designed by the General Electric Co. A platform on the side enables the locomotive operator to leave the inclosed cab, for observa-

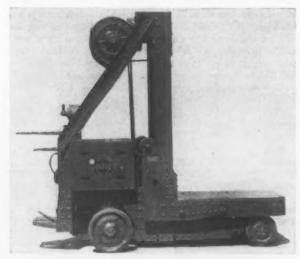


Air Brake Equipment Is Used for Braking and for Operating the Dumping Mechanism

tion purposes. The cab is of the double-deck type and is sometimes lined with asbestos as a means of protection from the heat of the coke ovens. The equipment on the left on which the bell is mounted is the third rail collector, the third rails usually being suspended in the air. The locomotive is supplied with air brake equipment which is used not only for braking purposes but also to supply compressed air to operate the dumping mechanism on the quenching car.

Lift Truck for Handling Heavy Dies

A 6-ton lift truck, known as the Hy-Lift, and intended for use in handling heavy dies in plants doing



Heavy Construction Permits Lifting and Transporting Large Dies

pressed metal work, has been placed on the market by the Baker-Raulang Co., Cleveland.

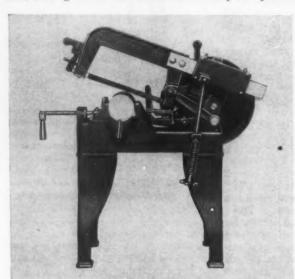
The main frame of the machine, which is here illus-

trated, is made up of two 8-in. and two 9-in. channels tied together by a 1-in. gusset plate. The roller frame is fabricated from four 1-in. plates and the platform is of %-in. steel and is carried by four 8-in. channels. The vertical track on which the roller carriage runs consists of two special 8-in. nickel-steel I-beams. The power plant employs an inclosed series motor driving through a worm reduction and full floating axle shafts. The driving axle is connected to the frame by means of the patented duplex compensating suspension, which is claimed to relieve axle strain and maintain accurate alinement between the axle and truck frame under all road conditions. The hoist is of the two-cable type and the drums are driven by a compound wound motor through a combination worm and planetary reduction—

New Metal Sawing Machines

A new power metal sawing machine called by its builders, the Peerless Machine Co., Racine, Wis., the Dry Cut, is here illustrated. The machine is of 4½ by 4½-in. capacity, and is intended primarily for maintenance and general purpose work where a saw of larger capacity or of heavier type is either unnecessary or impractical.

Accuracy of cutting and economical use of blades are general characteristics claimed for the machine. Features of design include positive lift on the noncutting stroke; conveniently adjustable feed pressure, spring controlled; and provision for automatic stop at completion of the cut. The saw frame is arranged so that it remains in any position in which it is placed while setting the stock. The machine may be operated



Positive Lift on the Non-Cutting Stroke and Provision for Quick Adjustment of Feed Pressure Are Features

at 100 strokes per min. when cutting low-carbon stock. Saw blades 10 in. long are used and the stroke of the saw is 4½ in. A ¼-hp. 1750-r.p.m. driving motor is employed. The floor space occupied by the machine is 16 by 30 in., and the net weight is 165 lb.

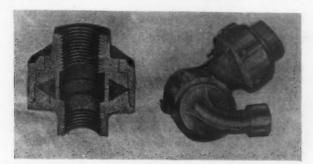
The Peerless company is also adding to its line a 9 by 9 in. Universal type high-speed metal sawing machine, similar to the 13 by 13-in. capacity machine described in The Iron Age of July 19, 1923. Features include a square saw blade frame; quickly adjustable spring controlled pressure, with worm and ratchet type of feed; blade back plate; swivel vise; three-speed gear box; lift on the non-cutting stroke; automatic stop and lift of the saw frame to the starting position at the completion of the cut; and the incorporation of height and depth gages.

The capacity of the machine when cutting at an angle of 45 deg. is 6 in. The blade used ranges from 14 to 17 in. and the stroke is 6 in. Three cutting strokes, 50, 85 and 125 per min. are available. For motor drive a 1½-hp. 1700 to 1800 r.p.m. motor is recommended. The floor space occupied by the machine is 26 by 52 in., and the weight, with motor, is approximately 1500 lb.

Swing Joint of Simple Design

Simplicity of design, leakproof construction and convenience of installation are claimed for the flexible or swing joint here illustrated, which is known as the Flexo, and is being marketed by the Flexo Supply Co., 104 South Main Street, St. Louis.

These joints are of brass, and are available in sizes ranging from ¼ to 3 in. An outstanding feature is



Swing Joint for Revolving Machinery Is at Left The universal joint is at the right

the formed, resilient seal which is mechanically compressed between two machined surfaces, as indicated in the cross section view herewith. The pressure of the fluid in passing through the fitting tends to inflate the seal, which with the mechanical compression, is claimed to provide a joint that is tight under high, low or fluctuating conditions of pressure and regardless of the angle to which the joint is swung. By varying the composition of the seal, the joint may be used for conveying any fluid that has no deteriorating effect on brass.

It will be noted that there are no ground parts nor springs, and that packing is not required. The joints are made up in four styles, for use in pipe lines conveying steam, compressed air, water, oil and other fluids. Style A, a cross section view of which is shown, is for use with revolving machinery, in place of stuffing boxes; style B is for right-angle bends; style F, a double angle return bend, and style H, a universal joint, shown at the right in the illustration herewith.

Develops Small Bending Machine

A tool for bending small steel bars and angle iron, including round bars and notched angles up to 90 deg., and having a capacity for mild steel sections 1/4 in. by



Tool for Bending Small Angles and Other Sections

2 in. in size, has been placed on the market by the Dreis & Krump Mfg. Co., Seventy-fourth Street and Loomis Boulevard, Chicago. The arrangement of the tool, which is known as the Buckeye bender, may be noted from the illustration. It is of steel and all working parts are hardened. The base is a steel plate and the body is of inverted channel iron. Adjustment for various thicknesses of stock is provided, and the tool is equipped with an adjustable drop gage for short bends. The material is held in place by means of an eccentric which is said to assure accurate bending. The weight of the tool is 55 lb.

Relining one of its Cleveland furnaces in 23 days is the record achieved by the Otis Steel Co. The furnace made its last iron Nov. 20 when it was blown out and the relined furnace was relighted Dec. 13.

American Foundry Equipment Co. to Consolidate Manufacturing Plants

The American Foundry Equipment Co., 366 Madison Avenue, New York, manufacturer of foundry machines, has purchased the Dodge Mfg. Co.'s plant No. 4 at Mishawaka, Ind., and will consolidate its manufacturing there, giving up its present plants at Chicago and York, Pa. The executive offices of the company will also be moved to Mishawaka about Jan. 1.

The following changes in personnel have been made: E. A. Rich, Jr., becomes vice-president in charge of sales; Fred Graf, formerly foundry engineer for Frank D. Chase, Inc., Chicago, has been elected vice-president in charge of production, development and engineering; O. A. Pfaff continues as treasurer and also becomes comptroller; G. E. Wyatt has been appointed assistant sales manager and advertising manager, succeeding R. H. Kelley, who recently resigned.

Harry A. Schwartz, inventor and patentee of the Schwartz "Di-Mold" process for making castings in permanent molds, will be actively associated with the company in the technical development of this process. Charles D. Steinmeir, who has been in charge of the plant at York, Pa., will be in charge of the commercial development of the "Di-Mold" process. Mr. Steinmeir was at one time foundry superintendent for the Nordyke & Marmon Co., Indianapolis. James Rigby, formerly sales manager, continues with the company as Eastern district sales manager.

Stanley Works to Have Belgian Plant

The Stanley Works, Inc., New Britain, Conn., announces the purchase of a site with manufacturing buildings at Antwerp, Belgium, for the manufacture of builders' hardware for its European trade. About 200 workmen will be employed in the European works. E. Allen Moore, chairman of the board of directors of the Stanley Works, Inc., in making the announcement, said that for a time the company was able to meet foreign competition by shipping its products from its American plant, but as wage rates in Europe have gradually declined since the war it has become impossible to meet the lower prices quoted by European competitors. "We were obliged to choose between giving up our export business and manufacturing our products in Europe," said Mr. Moore, "and we chose the latter course."

Steel Fabricating Plant for Florida

A steel fabricating plant is to be erected in Florida. It will be built at Jacksonville by the Highway Iron Products Corporation, of which C. V. Joseph is the head. The plant will specialize in steel bridges and corrugated culvert pipe. The company has had a plant at Ligonier, Ind., for the past seven years. The Florida shop will have an initial capacity of 600 tons of fabricated steel a month. In addition to manufacturing facilities the company will carry a stock of steel plates, bolts, nuts and rivets, steel beams, columns, trusses, and reinforcing bars.

Issues Bulletin on Anthracite Coal Strike

Developments of the anthracite coal strike are reviewed in a bulletin issued by the Natural Resources Production Department, Chamber of Commerce of the United States, Washington. The bulletin emphasizes the campaign for the use of substitutes being carried on by officials of the New England and other anthracite consuming areas. The substitute receiving most attention is bituminous coal of the low-volatile variety. Other substitutes recommended are oil, coke, gas and wood. Attention is called to the steady supply of this coal from the bituminous fields. Other matters described include the "check-off," the Jacksonville agreement, the econonic situation confronting the anthracite industry, wages, increased efficiency and its relations to prices, and arbitration.

Iron and Steel Production Above Normal; Consumption Continues Large

Pig Iron Output in Line with Steel Production—Expansion May Be Maintained for Some Time—Caution Advisable

BY DR. LEWIS H. HANEY
DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

THE production of pig iron and steel ingots is clearly a little above normal. That is, the output of these products, making due allowance for the normal growth of the country's requirements and for merely seasonal variations, is somewhat larger than usual. This is true on any reasonable basis of calculation. Judgments as to normal requirements may differ, but when allowance is made for seasonal conditions the output of pig iron and steel is now sufficiently great to be above any reasonably determined trend line. Even the unsatisfactory index of the percentage of blast furnaces active is nearly up to the mythical 60 per cent line.

The recent upward trend of the number of blast furnaces active makes it probable that the December rate of production will be higher than that of November. There was a net gain of 14 active furnaces in November and the prospect now is that more furnaces will be blown in after the turn of the year. It, therefore, seems that a time has come when the producers should exercise restraint in order that over-production and a weakening of the markets may be prevented.

One of the most hopeful indications shown by the November data is that the output of pig iron has not been gaining too rapidly on steel production. As long as pig iron production is not out of line with steel-making activity, one of the most dangerous maladjustments of the industry is absent. Perhaps the undoubtedly large consumption of steel at present will support the situation for a considerable period. While the actual consumption of steel is above normal and the production of pig iron is in line with steel, the expansion of the industry may be maintained.

All the evidence of the past, however, indicates that production above normal can not be continued indefinitely and it therefore seems timely to suggest that steel makers should "watch their step," to use a slang

There is good reason to believe that prices of pig iron and steel can not be advanced much further and that the current moderate upswing in such prices may be expected to flatten out early next year. This in itself will doubtless tend to check production, but if producers will exercise caution any correction required will naturally be less drastic.

Unfilled Orders Still Low

A S shown in Fig. 1 the production of steel ingots in November increased more than usual for the month. Our index was the second highest for 1925 and was more than 22 per cent greater than a year ago. Unfilled orders of the Steel Corporation also showed a large increase—larger than that of the preceding month. The unfilled orders, however, are smaller than at the spring peak and are certainly low compared with current production. The significance of the November increase in orders is rather uncertain, as it may contain a large amount of rails which would not mean much regarding the trend of the industry; but on the whole the November gain seems to indicate a very fair buying for the first quarter. As to prices, the average of The Iron Age index of finished steel prices for November was 2.433c., against 2.405c. in October and the low September average of 2.397c. Recently the figure has been rather steady at around 2.45c., which compares with 2.481c. a year ago.

Large Price Advance Unlikely

THE fact that steel ingot production has for some time been a little above the long-time trend of normal requirements and the further fact that unfilled orders are relatively low explain the price trend. Under the circumstances steel prices are naturally at a rather low level and are showing but a very moderate advance. The situation makes any large general advance in steel prices unlikely.

While the ingot output will probably exceed that of 1923, we note that it is far from being so much in excess of requirements as was the case in that year. Attention is invited to the fact that the area between

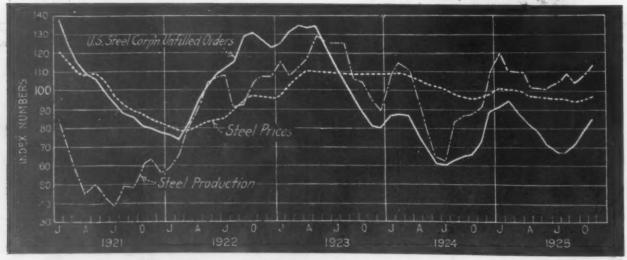


Fig. 1—Production of Ingots Is Now Considerably Above the Estimated Normal, but Unfilled Orders Still Show an Upward Trend

In This Issue

About 400,000 tons of pig iron has been imported this year.—Twice the 1924 total; consequently only 10 of 44 merchant furnaces on Atlantic seaboard have been operating recently.—Page 1657.

New coke plants proposed for Philadelphia and Richmond to aid merchant furnaces in lowering costs.—Beehive ovens made 70 per cent of 1913 coke, by-product ovens 30 per cent. Now by-product ovens make more than 70 per cent.—Page 1658.

Iron and steel output both above normal but well balanced.—And so long as pig iron output does not outrun steel production, expansion may continue.—Page 1678.

Machine makes open-hearth back-wall in five minutes.—Substitution of mechanical for manual patching of slag lines may lead to redesign of furnace to permit use of wider hearths.—Page 1673.

Producer gas equipment uses 3.52 tons of coal to every base box of tin plate made in Canonsburg, Pa., plant.—Ordinary Pittsburgh run-of-mine used as fuel. Overall fuel conversion efficiency of 78 obtained in well-arranged plant.—Page 1665.

Materials handling equipment fixed charges easily figured.—F. D. Campbell suggests 10 per cent for depreciation, 1 to 1.5 per cent for maintenance and repairs, 6 per cent interest on investment, plus insurance, power and labor.—Page 1669.

One-third of all industrial accidents occur in connection with materials handling.— Elevators and hoists most dangerous, cranes and derricks next in hazard list, then conveyors and trucks.—Page 1669.

Small electric generating plants disappearing in New England.—Factories using purchased current and homes and farms tapping great unified power system.—Page 1689.

Popular aversion to consumption taxes continues.—New tax bill reflects public attitude: further exemption of small taxpayers regrettable.—Page 1682.

Replacement business of automobile manufacturers will exceed 2,000,000 cars a year within short time.—Most of 20,000,000 cars now registered were made since the Armistice.—Page 1682.

During last 20 years pig iron output has increased 69 per cent.—Portland cement production during same period has gained 332 per cent.—Page 1683.

168 tons of material require handling for every ton of finished castings.—According to Max Sklovsky; A. S. M. E. committee estimates 224 tons handled for average ton of finished metal products in consumers hands.—Page 1670.

Favors elastic interpretation of immigration and recommends importing labor when needed.—Secretary of Labor James J. Davis so reports to Congress.—Page 1672.

American Mining Congress urges settlement of industrial disputes by arbitration.—Also commends non-partisan drafting of tax legislation.—Page 1659.

Organize to fight Government participation in commercial enterprises.—150 trade associations combine to restrict Federal and State Governments to political rather than economic activity.—Page 1687.

Two Belgian plants produce 3500 tons of seamless tubes monthly.—Description of Mannesman process for making large sizes of seamless tubing.—Page 1713.

Three main problems in physical testing of metals for aircraft.—Selection of representative samples, design of specimens and methods of loading.—Page 1660.

The Iron Age, December 17, 1925

CONTENTS

December 17, 1925

The Future of Merchant Pig In	on1657
Testing Metals for Aircraft	1660
Economizes Fuel in Tinning	1665
Economy in Materials Handling	g
Open-Hearth Boils of High Vis	gor1671
Iron and Steel Production Abo	ove Normal
Mining Congress Favors Arbitration1659	NEW EQUIPMENT
Technical Control in the Foundry	Machine Repairs Furnace Slag Lines1673 Electric Hoist with High Lift Feature1674 Jig Boring Machine1675 Electric Locomotive for Coke Quenching Cars
Great Power Systems Open Markets1689 Coordinated Statistics in Business1710 It Pays to Teach Workers1710 Fence from Scrap Pipe1712 Belgian Seamless Tubes1713	American Mining Congress1657 Foundrymen's Meetings1664, 1688
Cadmium Plating for Rust Resisting1713 Small Publications	DEPARTMENTS Editorial

Word Pictures of the Open-Hearth Process

THE series of three articles on "open-hearth boils" which is concluded in this issue is a notable addition to the literature on the metallurgy of steel. It covers the difficult task of putting into words what one may observe in looking through the blue glasses of the steel maker. It essays to make recognizable some ten definite differences in furnace conditions, something never attempted before, except for explaining the main reactions of the open-hearth process.

In these word pictures Henry D. Hibbard facilitates the transference of skill, the acquiring of experience and the ripening of judgment in a field which needs more of the scientific approach.

For News Summary See Reverse Side

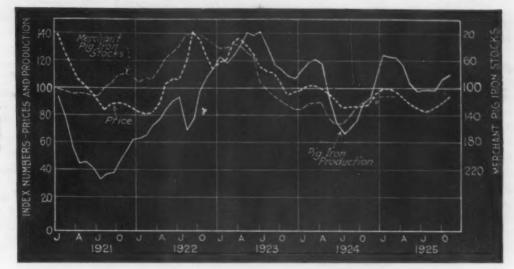


Fig. 2—Pig Iron Output and Prices Continue to Trend Upward; Stocks Said to Be Low

the 100 per cent line and "production curve" as shown in Fig. 1 is far smaller this year than in 1923. This means that, in comparison with the growing normal requirements the output has been maintained at a much more moderate rate. In fact, when compared with the other years shown in he graph, 1925 production of steel ingots appears remarkably stable and near to normal.

Pig Iron Stocks Small

THE pig iron situation is illustrated in Fig. 2. Clearly the rate of production continued upward in November, the small decrease in the month's total being less than usual. We estimate that pig iron production, while it is considerably under the peaks reached in each of the last three years, is about 9 per cent above the long-time trend. Pig iron production in 1925 will probably fall short of the figure reached in at least five other years (while the steel output will almost certainly break all records).

Stocks of pig iron are believed to be relatively small and trade reports have it that the quantity unsold which is held by merchant producers is light. Nevertheless, as production increases further it may be expected that the decline in stocks will cease, just as happened early this year when the pig iron output went above normal. Almost always when stocks begin to accumulate pig iron prices weaken.

The average of pig iron prices for November was about \$21.17 against \$19.92 in October. The recent figure has been \$21.54, which represents an increase of over \$2 from the low point of the year.

It does not seem probable that the price of pig iron can advance much further. Doubtless the December average will be higher than that of November and the prospect for firmness for a time thereafter seems good. Production in excess of normal trend, however, will in a few months lead to an accumulation of stocks and soon check any advance. In this connection the weak-

ness of the scrap market may be noted. Imports of foreign pig iron continue to be a factor, notably recent imports of the German products at a low price. A settlement of the anthracite strike and the greater certainty as to coke prices which would result, might well bring some decline in prices.

General Price Level Rises

THE Bradstreet index of commodity prices continued its gradual rise of recent months with a 0.6 per cent increase as of Dec. 1 (See Fig. 3). As usual, The Iron Age composite price of finished steel has followed the Bradstreet index with a lag of a few months and the continued upward trend of the former creates some presumption that steel prices will continue very gradually upward for at least another month or two. Under the influence of a large supply of money and a moderate rate of general production in comparison with demand, the average trend of commodity prices is still slightly upward.

While scrap steel prices averaged higher in November the market has recently not been strong. Heavy melting scrap at Pittsburgh remained at \$19.50 throughout November and early December. The supply is large and pig iron is relatively abundant and cheap. No sign of strength in scrap is apparent and the market may logically be expected to remain irregular in the near future.

the near future.

The spread between billets and pig iron during November appears to have been a little too great, and suggests that either pig iron must weaken a little or billets be marked up. On the other hand, the spread between billets and bars seems to be about normal, while wire and sheets are still rather low in comparison with billets and bars. It therefore seems improbable that billets can stand much of an advance and, consequently, the position of pig iron is not favorable for any sustained rise.

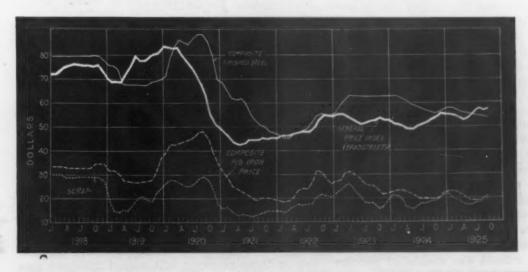


Fig. 3 — Bradstreet's General Commodity Price Index Number Continued to Rise Last Month; Upward Movement Still in Evidence

THE IRON AGE

A. I. FINDLEY, Editor

W. W. MACON, Managing Editor

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York C. S. BAUR, General Advertising Manager

F. J. Frank. President

George H. Griffiths, Secretary

Owned by the United Publishers Corporation, 239 West 39th Street, New York. Charles G. Phillips, Pres. A. C. Pearson, Vice-Pres. F. J. Frank, Treas. H. J. Redfield,

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh Park Building. Boston: 425 Park Square Building. Phila delphia: 1402 Widener Building. Cleveland: Guardia

Building, Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Edg. Buffalo: 833 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St. London, Eng.: 11 Haymarket S.W.1.
Subscription Price. United States and Possessions, Mexico, Cuba, \$6.00; Canada, \$8.50; Foreign, \$12.00 per year. Single copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, N. Y., under the Act of March 3, 1879. PRINTED IN U. S. A.

The New Tax Bill

QO great an improvement over the existing law is the new bill for Federal taxation, introduced in the House of Representatives, that criticism of it is almost ungracious. That it was formulated by the Ways and Means Committee as a whole and introduced as a non-partisan measure is in itself a step in advance in the practice of legislation. If only the Senate can be equally broad-minded and patriotic.

The bill provides for a large abatement in taxation, which is a blessing however it be allotted. The economist of one way of thinking will deplore that the bill still shows thought of the use of taxation as a social adjuster. Another group will applaud it for the same reason. The wasteful inheritance taxes and the surtaxes on large incomes are to be ameliorated, not as a correction of injustice but on the ground of expediency. Then came the cry that something must be done for the little fellow, wherefore lowering of base rate and increase of exemption limit.

This piece of demagogism is regrettable. The Treasury had informed the committee that the collection of the small taxes is relatively inexpensive. It is desirable that the maximum number of citizens feel the incidence of direct taxation and appreciate that the cost of government is their own affair. Moreover, we believe that the millions of small taxpayers, rather than minding the few dollars a year assessed to them, enjoy the dignity of making out a return and enrolling themselves in the more substantial class of citizenship.

The well-to-do-the professional men, highsalaried men, merchants, and others-who earn incomes of \$20,000 to \$50,000 a year, get but little relief, the surtax rates for them remaining unchanged. However, the discount on incomes earned, the limit of which is raised to \$20,000. helps them somewhat. Agrarian animosity is still directed against this great tax-paying class, but the venom is less since the day of Mr. Kitchen, who required these earners to double their tax.

The new bill reflects the continued popular

aversion to consumption taxes. The automobile manufacturers secured a reduction of the rate on cars, although this is a tax that they pass immediately to the buyer. The Federal Government spends annually a great sum for improvement of the roads, and this widely-spread tax brings in money from the people who make most use of the roads. It may be wondered why the committee did not think to maintain the automobile tax on high-priced cars and exempt Fords. The amusement tax is also of the nature of a consumption tax, but it had been previously fixed to apply only to the high-priced.

It will be a long time before the American people will consent to a general sales tax, such as some statesmen urge. At the present time the majority of voters do not even want to have a simple income tax of uniform rate. They want a tax that will rest especially upon some States and some classes of people. This reflects largely the notions of the farmers, who conceive that they are the victims of economic injustice and in this way aim to get square. Their aim ought to be the abolition of economic restrictions, not the imposition of more of them.

Automobile Replacement

POR some time it has been apparent that replacement of wornout units is a large and growing factor in the automotive industry. A recent estimate as to the average length of service of cars put it at about seven years. Replacement on this basis for cars built seven years ago would mean fully 1,000,000 cars, simply to fill the gaps of outworn equipment. Any excess over this represents new users.

Production of 3,600,000 cars in the United States in 1924 coincides with the addition of 2,-500,000 to the total registration. The difference between these two figures checks roughly the estimate in the above paragraph. With the growing number of cars in use, however, replacement production must grow rapidly until, within the next two or three years, it will exceed 2,000,000 cars per year and shortly approach 3,000,000. More than one-third of this year's 4,300,000 cars may be counted as replacement units.

In this connection it is interesting to note that during the three years 1923 to 1925 inclusive more than 12,000,000 automobiles and trucks have been produced in the United States (including American makes turned out in Canadian factories). This compares with a total production, in all of the years which went before, of about 16,000,000 cars. Of the grand total of 28,000,000 produced in 30 years, about 20,000,000 are now registered in the United States. Exports and imports have been only a drop in the bucket, hence we may conclude that 8,000,000 have been destroyed. But 8,000,000 is more than the entire production of the United States up to the Armistice. In other words, our present congestion of cars represents substantially the production of seven years only.

Prosperity from Efficiency

It is safe to predict that when manufacturing and other business concerns ascertain their profits for the year 1925 these will be found in general to compare more favorably with those of 1924 than a comparison of market prices would have indicated. Generally speaking, there has been a larger turnover and unit costs have decreased partly on this account and partly from increased efficiency.

Linked with this change, there has been disclosed a larger power on the part of the American people to absorb goods than would have been expected merely from the appearance of industrial activity presented. To an extent in two or three preceding years, but more markedly this year, the statistics of production and distribution in actual quantities of goods have shown larger figures than would have been estimated by the standards of the past. That is, it is found that it is easier to produce and easier to consume than it used to be.

It may be comforting and inspiring to reflect upon this favorable trend, but reflection should not stop there. The bearing upon our business conduct in future, and our general political economy, should be considered.

The concern in this connection is chiefly as to our merchandise imports and exports. Europe is to be rehabilitated, put in condition for greater production and consequent lower unit costs. On this phase of the Locarno agreements much of the comment indulged in has been to the effect that Europe is going to give us stiffer competition. The spirit of the comment is that therein lies a menace to our own well being.

It is one thing for the American people to cling to old ideals in morals and statecraft and another thing to cling to a political economy that is out of date. We were a debtor nation up to the war and had to export more merchandise than we imported in order to remain solvent. Now the people of the United States are creditors to the extent of some ten billions of dollars loaned, and the Government is creditor in claims that now

promise to be in course of liquidation for a couple of generations by payments of several hundred millions annually.

Some people are indisposed to embrace the consequences of this new alinement, the ideas of the past being so strongly imbedded, and their basis being apparently forgotten. There is now a different basis. Acceptance of the new situation will be furthered by reflection upon two things which the course of business in the United States in the past three or four years has shown. First, that the American people have a larger power of absorbing commodities than was assumed, hence are growing better able than has been thought to absorb some foreign merchandise also. Second, manufacturing industries have prospered, although engaged at much less than their productive capacity, hence are found to be better able to get along without exports to employ the "surplus capacity" than has been imagined.

We have been getting into position to stand larger imports relative to exports than formerly, and this situation is being accepted, but the swing should not be encouraged by inflation. We need to keep our prices in bounds, and the results of the past few years show that through efficiency we are acquiring the ability to do so.

Cement and Iron

ONSUMPTION of Portland cement makes a new high record this year by about 7 per cent, following sharp increases in 1922, 1923 and 1924. Nevertheless the long range comparison shows that cement has not been gaining in the past ten years at anything like its rate in the preceding ten years. Perhaps cement is beginning to show what other industries have shown, that a very rapid growth is possible up to a certain point, when the activity becomes so large relative to the general activity of the country that a more moderate pace must follow. High geometric ratios of growth are impossible of indefinite continuance, for otherwise a given thing would in time crowd out everything else.

Assuming Portland cement shipments this month at the mean of the two preceding Decembers, shipments by quarters compare as follows in two years:

Portland Cement Shipments, Barrels

	1924	1925
First quarter	20,138,000	21,456,000
Second quarter	42,358,000	48,630,000
Third quarter	50,296,000	54,225,000
Fourth quarter	32,955,000	*31,435,000
Year	145,747,000	155,746,000

^{*}Partly estimated.

Unlike iron and steel, Portland cement had a backset during the war and through 1919, and this may account for the rapid increase since, hence this year may be taken as normal for these times. Taking for a ten-year comparison the average of 1914-5-6, there is a gain of 75.9 per cent in ten years, equal to 5.8 per cent annually. In the preceding ten years, taking the 1904-5-6 average as a basis, there had been 145.4 per cent increase, or an average of 9.4 per cent annually.

Thus the annual percentage rate of gain in the

past ten years has been less than two-thirds of that in the preceding ten years.

The rate of pig iron gain slowed down earlier, just as would be expected, for iron is a much older material, in point of general industrial use, than cement. The Abram S. Hewitt rule of pig iron doubling in ten years held out very well until early in the present century, say until some time after 1906. From 1905 to 1925 pig iron has increased only 69 per cent, while cement has increased 332 per cent, taking for each commodity the mean of 1904-5-6 to represent 1905.

The bare figures would suggest confirmation of the fears felt some 20 years ago that concrete would interfere with the growth of iron and steel consumption, acting in a way as a substitute; but consideration of all the circumstances indicates otherwise. The usefulness of concrete as a construction material has tended to stimulate construction. It would be idle to assert that men would be doing as much today in any line of endeavor as they are doing, if it were much harder to do the things. In many cases cement has been an aid rather than a hindrance to the expansion of iron and steel consumption. The divergence in the figures of growth is due to the general principle that no activity can increase indefinitely in a much greater geometric ratio than the population increase.

Steel Making vs. Slag Making

COMMENTING recently on the open-hearth process and the problem of making good steel in greater tonnages, a prominent metallurgist remarked that the head melter makes slag rather than steel. "The process of steel making," he said, "is not so much to make steel as to make slag."

Bizarre as this statement may sound, a little examination shows that the paradox is more apparent than real. The speaker did not have in mind the blast furnace slag which is turned into cement, or those high-phosphorus slags which make good fertilizer. He had reference to ordinary, every-day American practice, making tonnage steels, and he maintained that it was in practice a slag-making rather than a steel-making process.

Think for a minute what can be done to a heat after it is once in the furnace. The pig and scrap can be selected, but to convert this mixture into liquid steel (which means to remove impurities and adjust certain alloying elements) the workmen can do only a limited number of things. They can vary the temperature of the hearth; they can increase the time at heat; they can stir the bath; they can add ore, lime, fluorspar; they can add other metal or metallic alloys. If the distinctively alloying operations are disregarded and attention fixed on the purifying operations, it is obvious that these are all directed toward adjusting the slag to correct composition, fluidity and temperature.

Stage by stage, during melting, working and tapping, the condition of the slag is of first importance in managing a successful heat—a truth more evident in electric furnace refining, where more than one slag may be made, worked and skimmed, before certain impurities are eliminated to the

last degree. In fact, it is a truism that successful steel making demands the correct amount of slag of proper composition and temperature. When the furnace men have provided this the steel almost makes itself.

Workmen at the furnace realize these facts thoroughly. They pay continual attention to the slag and the temperature. Progress of the heat is known by the way the gas bubbles break through the slag, the consistency of the slag in the furnace and the thickness of the slag blanket. Metal tests are drawn from the furnace from time to time and the surface and fracture examined, and some of them are analyzed by the laboratory. But the melter pays even more attention to the slag which chills on the rabble bars or on the spoon handle—how it flakes off, its color, luster, transparency and soundness. Especially at the end of the heat are all these signs noted carefully.

It is surprising what a delicate indicator is slag, when observed by the skilled eye. Doubly surprising because these indications represent a body of experience acquired almost wholly by plain furnace men, without guidance of more scientific control. It doesn't take long to be able to judge carbons at the end of the heat, because each estimate made on a fractured test is immediately verified or corrected by a chemical analysis. But who is to tell Tom or Tony, the first helper, the precise shade of green glass that represents the proper tapping slag for a heat of spring steel? Or what to do if it is just the least bit milky?

If Tom or Tony knows how to make the right slag it's a pretty safe bet he has the "makings" of a good melter. We venture the further opinion that metallurgists also will know more about steel making when they know more about the slags.

THAT public operation is wasteful and ineffi-L cient may be shown, if further evidence be necessary, from the railroad history of 1925 compared with that of five years ago. Total car loadings have increased from 45 millions to 52 millions (estimated, on basis of 48.4 millions for first 48 weeks). Yet the number of employees has declined from 2,054,000 to 1,763,000, a drop of 14 per cent. Payroll disbursements have fallen from \$3,734 millions to \$2,873 millions (estimated, on basis of \$2,155 millions for nine months). And the record-breaking traffic of 1925 has been handled virtually without car shortage, compared with the exasperating delays, congestion and confusion that were common under Government operation and for some time thereafter. True, the roads were turned back to their owners on March 1, 1920, but for many a month longer swollen payrolls and snarled traffic continued to vex and defeat the management.

Our imports of manganese ore this year show some interesting tendencies. Brazil still holds the lead obtained during the war, but increasingly large quantities are coming from other sources. Expanding receipts from its mines have brought Russia's proportion of the total of 380,000 tons to Oct. 1 this year to 34 per cent as against 35.7 per cent for Brazil. These are the

largest imports of Russian ore since the war. More interesting are the ores from Africa, which are coming in in larger quantities than ever. At 12.5 per cent of the total for the first nine months they are in third place, India coming fourth with 11 per cent. The African ores, which are of high quality, are being extensively used by the pro-

ducers of electric ferromanganese in Norway. Receipts of Cuban ores have increased to 2.5 per cent of the total this year. While domestic supplies of high-grade manganese ores continue negligible, there is satisfaction in the increasing competition among foreign producers of so highly essential a raw material.

CORRESPONDENCE

Heavier Loading of Cars by United States Steel Corporation

To the Editor: We have been observing the efficient functioning of the railroads in handling an enormous tonnage during the present year. The record up to the present time is the largest volume during any similar period in the last five years, and this demand for transportation has been met by the carriers currently, there being no acute shortage of cars at any time.

The average daily movement of freight cars by the railroads in September, 1925, was the highest for any September on record, according to the Bureau of Railway Economics—30.7 miles per day—which aids materially in creating a regular supply of equipment.

However, there is one feature that has considerable bearing on the transportation problem which, it would appear, is not being followed up systematically by shippers and railroads; i.e., heavier loading of cars. The average capacity of freight cars of the Class I railroads as of July 1, this year was 44.5 tons, as compared with 43.8 tons a year ago; but this capacity is not being utilized to the fullest extent. In August, 1925, the average load per freight car in the United States was 27.8 tons, while in September, 1925, it was 26.8 tons, indicating there is little progress being made in increasing the average carload generally.

The 13 shipping companies of the United States

The 13 shipping companies of the United States Steel Corporation took up this question of heavier loading of cars in a very vigorous manner in the year 1911 and have followed it up closely ever since. The result is that for the quarter ending Sept. 30, 1925, they reached the highest average load per freight car in their history, 99,200 lb. or 49.6 tons, 5 tons greater than the average carrying capacity of equipment of the Class I railroads. The average load of 99,200 lb. does not include the iron ore shipments of the Oliver Iron Mining Co., all of which cars are loaded to carrying capacity and would have increased the average load. This increase of 1400 lb. per car over the same period in 1924 resulted in the manufacturing companies being able to move their outbound product during the third quarter, 1925, in 11,435 fewer cars than would have been required under the average load of 1924.

We admit that to some extent the average carload has increased due to the larger capacity equipment which has been furnished by the carriers; but we are convinced this remarkable record of high average carload was brought about mainly by every company following it up regularly through the shipping departments. The average carload of the manufacturing companies in 1911 was but 69,200 lb., while for the year 1924 it had reached 95,500 lb. per car, or an increase of 38 per cent, and there has been no like increase in the capacity of equipment. This question of increased loading is one for each individual shipper and railroad to follow up daily with the idea of having all cars loaded to full carrying capacity. The decision of the railroads to have all freight cars stenciled with the nominal capacity and load limit should assist in increasing the average carload throughout the country. The importance of loading cars to carrying capacity

The importance of loading cars to carrying capacity should be given serious consideration, for it has a twofold purpose: economy in yard switching at mills and factories and reduced operating cost to the railroads, with high revenue load per car unit. Large carrying capacity equipment is built with a view to obtaining increased revenue per car unit, which in the last analysis, is economical for both shipper and carrier.

J. M. Morris,
Pittsburgh, Dec. 8. Traffic Manager National Tube Co.

A Jobber's Plain Comment on the Situation in Steel

To the Editor: Your editorial of Dec. 3, "The Field of the Jobber," is more than timely. Steel manufacturers ought to realize that they cannot sell a jobber and also the jobber's customer at the same time and at the same price. And more especially so for assorted sizes in a minimum carload of 18 tons of any given steel product, or lots of less than 18 tons.

given steel product, or lots of less than 18 tons.

Unless the steel manufacturers adopt soon a different policy towards the large and legitimate steel jobber, the occupation of the latter will be gone. Steel companies have fallen into a state of complacency in respect to what is, and should be, a very serious matter for them, so far as the future wholesale distribution of their steel products by large jobbers is concerned. Not only do many large steel companies, as well as the small ones, have no selling policy in favor of the jobber, but during the past year or two, and more particularly now, they seem to think that the large steel jobber is superfluous and should be eliminated, to the end that they can sell their steel products direct to the ultimate consumer.

Steel Mills Are the Reservoir

The large steel jobber should be more correctly termed a steel merchant. The word "jobber" is a misnomer. The large steel jobbers in this country have invested hundreds of millions of dollars of their cash capital in various steel materials, warehouses and warehouse equipment; and particularly so in tonnage steel lines. Through what I regard as a shortsighted and mistaken policy of many large and small steel manufacturers, there is today too much "hand-to-mouth" buying of steel products. The steel mills are now carrying the inventory and not the steel jobbers as formerly. Were it not for this vigorous and aggressive policy of the steel mills, the steel jobbers in this country would now be laying in very heavy stocks, both for present and forward shipments. If such were the case, the steel mills would quickly attain full capacity operations and maintain this capacity production for some time to come.

This entire problem pertains to many leading steel lines. These very small orders, even in their aggregate, are of no permanent benefit to steel mills. Certainly not in comparison with the kind of orders which would come from the large steel jobber. His is a permanent, steady business, year in and year out, and not transitory.

Protection to the steel merchant is still given in some steel lines. Surely a method can and should be devised to recognize the rights and standing of those who are steel jobbers both in name and in fact, and so permit them to travel in a fair and certain business orbit. Thus they would continue to be a valuable adjunct of the steel mills as in the past. At present the future of the large steel jobber is dubious.

A new era in business is upon us. Yet I regard this entire question as being fraught with harmful possibilities, unless drastic measures be taken at once to check these false policies and fallacious reasonings. Any manufacturing producer has a right to nominate his own sales policy and sell to whom he pleases. Yet

consequences will follow, and I think beyond the reckoning of many steel manufacturers who view this subject too lightly.

I believe at least the larger steel companies should have a broad gage policy of "live and let live," and endeavor to inculcate this spirit in the minds of their smaller competitors, and more by example than by precept. The president of the largest steel corporation in the world has achieved part of his greatness because he is a merchant and has a thorough grasp of the principles of merchandising. The status of the steel jobber, in the full significance of the word, should be clearly defined. Otherwise it will behoove him to put his time and energy and capital in other enterprises. This has already commenced and on a large scale.

Small Lot Selling Costly to Mills

The vital trouble today with many lines of business is that not enough analysis is made of overhead expense. Selling less than carloads and many of these minimum carloads of various steel products to the small consumers, small retailers, brokers, agents, etc., costs the steel mills considerable additional and needless selling expense. Credit terms to many of such buyers are not only too easy but too loosely given. Such orders lessen the desirable tonnage that would come from large steel jobbers regularly. The amalgamation of such orders from many jobbers enables mills to produce the aggregate of this tonnage very economically. Also local sales offices of steel companies, in the different large cities, would require fewer salesmen and less overhead.

In very many cases poor judgment is used by the steel mills in the selection of the sales staff for their various local offices. Many of such salesmen are not conversant with conditions and their only desire is to

get orders, irrespective of the major considerations surrounding the industry, or the importance of long established steel merchant jobbing concerns being sustained and fostered in dull times, as well as in good times. A more careful selection of such persons would be of untold benefit to general steel affairs. Unnecessary and imaginary price competition would cease.

If the large steel jobber is gradually and finally dispensed with, through this policy of steel companies generally in selling his customers small quantities of material, and at practically the same prices quoted him, it would be well for the more experienced and seasoned steel manufacturers to carefully weigh and consider this new and radical policy before it is too late.

To conclude: The large steel jobber once destroyed can never be reinstated. The men comprising the vast domain of the steel jobbing business are of more than ordinary executive ability and initiative. The steel jobber, with large warehouses in one or more cities, performs a useful and necessary service in the business affairs of the nation. If there be no incentive for such competent and well organized concerns to remain in the steel jobbing business, a grave situation will arise in the future for many steel companies. The steel jobber or the steel merchant, name him as you will, is resourceful and will continue to be so. Results prove this. There are two sides to all questions; but the steel jobber is today confronted with certain facts. And facts are stubborn things to argue against.

Through years of experience and a detailed knowledge of what is here written, I can speak with authority. The many trade associations in this country with which the steel jobber is affiliated hold very strongly to the opinions herein expressed.

J. K. LARKIN,

President J. K. Larkin & Co., Inc.
New York, Dec. 10.

FOREIGN MONOPOLIES

Secretary Hoover Proposes Defensive Measures Against Extortionate Imports

Washington, Dec. 15.—Defensive measures against foreign monopolies and combinations in materials which American manufacturers are compelled to import are set forth in a letter from Secretary of Commerce Herbert Hoover to Senator Capper of Kansas, which was made public this morning, and was made in reply to a request from the Senator. The letter from Mr. Hoover is a strong arraignment of foreign monopolies which take advantage of their position to exact excessive prices. While it deals most particularly with rubber, it applies equally as well to other commodities which are imported.

Declaring that he is opposed to trade reprisals, Secretary Hoover says that some of the following measures would ultimately afford relief "if we had them organized, and all are wholly defensive in nature":

- Our bankers can be discouraged from giving American credits to the support of these combinations.
- We should initiate a strong systematic campaign for voluntary saving in use in every one of the commodities where these combinations become extertionate.
- We should stimulate the manufacture and use of substitutes.
 We should stimulate production in countries
- We should stimulate production in countries where the commodities in question are not likely to be subject to such combinations.
- 5. We might set up some sort of properly con-*trolled machinery for emergencies which would prevent our many hundred buyers from bidding against each other.

So far as the iron and steel industry is concerned in this subject its principal interest lies in products of mines, such as manganese ore and tin ore.

Because of this the most important suggestion made by Secretary Hoover, therefore, for the iron and steel industry is the suggested machinery for "emergencies which would prevent our many hundred buyers from bidding against each other." Secretary Hoover

has expanded this view on various occasions and it is evident that he has in mind an amendment to the Webb-Pomerene act, or entirely separate legislation, which would permit American consumers to combine for the purchase of imported materials which are controlled by monopolies and combinations. The Webb-Pomerene act as now constituted only permits of combinations for purposes of export.

"We are now subject to the full result of monopoly action and we have no machinery of adequate defense," said Secretary Hoover in his letter to Senator Capper. "It is inherent in all unregulated monopolies everywhere that they never can be content with reasonable returns but must sooner or later undertake extortion."

It is understood that Senator Capper will frame legislation which will be designed to meet the suggestions of Secretary Hoover and that if it is enacted it possibly will have a far reaching effect on the trade relations between industries of this country with other countries in connection with commodities which by their nature are under monopolistic control.

Granite City as a Steel Center

The New Industries Committee of the Illinois Chamber of Commerce, with headquarters at Chicago, held its first conference at Granite City, Ill., Dec. 10, to study the possibilities of that city as a steel center and for industries using by-products of coke. The conference was chiefly concerned with the operation of the Midland Coke & Iron Corporation, formerly the St. Louis Coke & Iron Co., whose president, W. G. Maguire, declared that the St. Louis district has all the necessary elements for the cheap production of steel, pig iron and coke, and has the advantage of an adequate market and good transportation. Clarence H. Howard, president Commonwealth Steel Co., predicted that the St. Louis district will in time eclipse both Pittsburgh and Gary, and he saw "steel mills literally covering all the land between Granite City and Belleville, 30 miles to the south." Representatives of 30 southern Illinois cities and Chicago and St. Louis business men interested in the steel industry attended the conference, a special train from Chicago bringing its delegation.

Opposes Government Competition

Trade and Industrial Organizations Start a Movement to Prevent Federal and State Intrusion in the "Proper Field of Private Enterprise"

Washington, Dec. 15 .- The first concerted largescale drive against Government participation in purely commercial activities was instituted here at a meeting held on Thursday and Friday of last week. Approxi mately 150 trade and commercial associations formed a permanent organization and arranged to set up headquarters in Washington to direct effort throughout the country in support of the conference's principle that the "function of the Government is political and not economic." The campaign will be carried on under The campaign will be carried on under the following executive committee:

Homer L. Ferguson, president, Newport News Shipbuilding & Drydock Co., Newport News, Va.; F. Highlands Burns, president Maryland Casualty Co., Baltimore; J. E. Edgerton, president Lebanon Woolen Mills, Lebanon, Tenn., and of National Association of Manufacturers; S. M. Williams, vice-president Auto-Car Sales Service Co., Ardmore, Pa., and Gen. R. C. Marshall, Jr., general manager Associated General Contractors of America, Washington. This committee is to serve for two years. F. J. Koster, president Koster Co., San Francisco; W. O. Washburn, president American Hoist & Derrick Co., St. Paul; Martin Insull, president Middle West Utilities Co., Chicago; Elmer Bliss, president Regal Shoe Co., Boston; G. S. Brown, president Alpha Portland Cement Co., Easton, Pa., and Harry Scullin, president Scullin Steel Co., St. Louis, will serve for one year.

Private Enterprise Endangered

The conference adopted a report declaring that industrial enterprises already in operation or contemplated by Government, municipal, county, State and Federal, "are of such magnitude and diversity of character that they are seriously endangering numerous private industries." Continuing, the report says:

Government enterprise pays no taxes. When Government displaces private business, the loss in taxes as well as the excessive cost of operation is levied upon property and business which survives. The national defense is best and most economically served by private business enterprises which may be converted to war purposes in case of emergency.

Government enterprise almost invariably incurs a loss far exceeding any possible profit. These losses constitute an unjustifiable waste of public money. Costs of government are concealed from the public by neglect to employ a system of cost accounting which fully reveals the total expense.

Government in business drives citizens out of legitimate

It discourages business which is threatened occupation. It discourages business which is squanders the money of the taxpayers, increasing their burdens. It is marked by extravagant delays, public inconvenience and loss. It deludes those engaged in agriculture, industry and commerce with estimates of cost in undertakings for which they must pay, piling up costs in excess of estimates under no responsibility or check.

Government and industry must be protected against the assaults of those who would destroy both by confusing the functions of each. The door of opportunity must be kept open.

We call upon every citizen to stand squarely upon the proposition that the American Republic is founded upon the private ownership of property and maintained by the private enterprise of those engaged in gainful occupations.

Objects of the New Organization

Purposes of the organization set up were declared to be:

To disseminate among the people correct information as

to the extent, cost and results of Governmental enterprises.

To urge that in all Government operations there be established a recognized and adequate system of cost accounting and that all existing prohibitions against rewarding on merit and efficiency be abandoned.

To inform the people that Government in business means the establishment of a socialistic state and the ultimate

To oppose every existing or proposed intrusion by Government into the proper field of private enterprise.

The membership of the conference was referred to as composed of trade association, business and profes-

sional organizations, and companies or individuals whose interests are or may be directly affected.

Various speakers cited what they considered were intrusions by the Government, Federal and otherwise, into fields of private activity. Among the speakers were William B. Ferguson, spokesman for the shipbuilding and ship-repairing industry, and Edward H. Duff, representing the American Steamship Owners' Association. Homer L. Ferguson, who presided at the opening of the meeting, also spoke for shipbuilders. President Edgerton of the National Association of Manufacturers cited examples of Government interformers in private in the state of the control of the National Association of Manufacturers of the state of the stat ference in private industry.

In opening the meeting Homer L. Ferguson declared that Government entrance into the business field is marked by waste, extravagance and attempts at self-glorification of officeholders who do not reveal the true cost of their operations because they do not reckon capital account, "a legitimate charge upon any busi-

Secretary Hoover's Comment

Secretary Hoover, in addressing the conference, sounded a note which apparently was not entirely expected. While the attitude of Mr. Hoover in strong support of private enterprise and initiative is well known, he frankly told the conference that he thought it would have great difficulty in establishing any precise lines of principle in the matter of Government in business. He asserted that one sidelight on it is that the demand that the Government get into business comes in large degree from the business world itself. He added:

What I feel that most people refer to when they talk of the Government in business is that they do not wish the Federal Government to engage itself in the buying of commodities or services for resale, and they do want the Government to procure services and commodities for its own use by competitive bidding from the business world,

I believe there are some points where the Federal Government could reduce its business activities. I am sure the whole Federal Government and Congress would welcome a sane study of the problem. Government officials are overburdened with labor and they welcome cooperation and the development of ideas and methods.

Independent Division of Trial Examiners for Federal Trade Commission

WASHINGTON, Dec. 15 .- The Federal Trade Commission has set up an independent division of trial examiners who, in the future, will be assigned to pre-side at hearings by the chief of that division. This change in procedure of the commission was determined upon as a result of criticism that the trial examiners, who have presided at hearings in the past, have been named by the examining division which investigates cases and recommends whether or not a complaint should be issued.

The commission has announced that the change made does not mean an increase in personnel or duties, "but only the assignment of those related duties where they logically belong."

Bethlehem Starts New Rolling Mills

The new 35-28-in. structural mill at the Lackawanna plant of the Bethlehem Steel Corporation went into scheduled operation on Dec. 14. The third of the four new Gautier bar mills at the Cambria plant at Johnstown, Pa., started rolling on Dec. 4.

RAW MATERIAL IMPORTS UP

Proportion of Non-Manufactured Goods Coming in Now Close to 70 Per Cent

The marked increase of American imports and exports of raw materials this year is an encouraging sign pointing to the improved condition of the world and especially Europe, says a statement issued by the National Foreign Trade Council, New York, of which James A. Farrell is president and O. K. Davis, secretary. Raw material exports for the first 10 months this year have been 13 per cent higher than those of the corresponding period of 1924 and imports of nonmanufactured goods have jumped 38 per cent over the first 10 months of last year.

A steady increase in our exports of crude materials

has been taking place ever since 1921, when they rep resented 22 per cent of all exports. Thus far in 1925 they represent 28 per cent of our export trade.

The tendency to build up industrial supplies for future production which is thus shown on the part of other countries is also active in the United States, as shown by the unusual proportion of all imports now represented by raw materials. In 1921 crude materials amounted to 59.8 per cent of all imports; today they are approximately 70 per cent. This is the highest proportion of non-manufactured goods ever brought into the United States.

Last year Europe took \$1,005,000,000 worth of our raw materials, the first billion dollar trade done with Europe for American raw materials since the war. Since 1919 Europe has been taking an average of 70 per cent of our annual export of raw materials. Last year Europe took 75 per cent of our raw material exports. This year a similarly high proportion has been maintained, and the volume of trade is strengthened by the fact that European spinners' takings of our cotton crop are already 14 per cent higher than last year's, with a net excess at present of approximately 250,000 bales over 1924.

The result is that along with the steady tendency in normal times to increase the proportion of finished manufactures among our exports, we find ourselves meeting a world requirement for crude materials as a

basis for increased production.

It is evident, of course, that a large proportion of this greatly increased trade in raw materials, so far as Europe is concerned, is being paid for by American loans abroad. The hopeful factor is, however, that the direction of such trade is now firmly established in the channels which will lead to production and a wholly new cycle may be expected to open shortly when the world, which is still consuming less in actual amount of goods produced than it did in 1913, may

once more reach par in the production of the goods necessary to maintain the normal economic life of its people.

Court Hears Arguments on Iron Ore Royalty Tax

WASHINGTON, Dec. 15 .- Arguments in the Minnesota iron ore royalty tax cases were made on Tuesday and Wednesday of last week before the United States Supreme Court. Appearing as counsel for the mine operators were Charles Evans Hughes and John G. Milburne, who attacked the validity of the law requiring owners of land leased, or rented for the mining of iron ore, to pay a tax upon the royalty received from In all, iron and steel producers who recover the ore. there were seven cases involved and because of the importance of the issue, the arguments were spread over two days.

Virtually all of the iron ore mined in Minnesota is produced on a royalty basis. It was pointed out that of the 45,000,000 tons of ore mined in Minnesota in 1923, only 311,000 tons was taken out by the owners of the land. Contention was made by the counsel for the operators that the iron ore industry is subjected to an arbitrary and unreasonable burden by reason of the

plants will be of the best modern design. It is understood that labor will be recruited in this district insofar as is possible. Work is to be started in the near future.

above will be supplied with steam of 350-lb. pressure and

200 deg. superheat from a boiler house, containing a sufficient number of boilers each of 10,000 hp. rated capacity. All

Mexican Steel Production Fell Off

Last Year Due to revolution in Mexico in the early part of 1924, the Monterey Iron & Steel Co., which has a blast furnace, steel plant and fabricating works near Monterey, Mexico, made a rather poor production showing in 1924, according to its annual report just issued. The blast furnace production for the year was only 19.485 tons, as compared with 44,311 tons in 1923, while the output of the steel-making furnaces was 37,-612 tons, compared with 59,216 tons in the previous year. The year's production of structural steel work was only 2086 tons, a fall of 1274 tons from that of the previous year. The foundry produced 2132 tons of iron castings and 337 tons of steel. The company's finished steel products include structural shapes, com-The American repmercial bars, rails and fish plates. resentative of the company is William G. Moler, Beekman Street, New York.

Large Expansion Program for Fairfield Works

BIRMINGHAM, Dec. 14.—An official announcement discloses plans for the expansion of the Fairfield, Ala., works of the Tennessee Coal, Iron & Railroad Co., including the construction of four open-hearth furnaces, two blast furnaces and other improvements, at an estimated cost of \$10,000,000. Details are given in a letter by George G. Crawford, president:

It has been decided to round out the development of the Fairfield works of the Tennessee Coal, Iron & Railroad Co.

To the existing open-hearth plant of four 140-ton furnaces, four additional furnaces of the same size will be added. The blooming and continuous mill will have additional heating furnaces and ingot strippers. Two new blast furnaces of 600-tons daily capacity each will be built discount to the new blast furnaces of 600-tons daily capacity each will be built

adjacent to the new high line, convenient for delivery of ore.

A battery of 77 16-ton by-product coke ovens will be added to the Fairfield coke works. Coke will be delivered from the ovens to the new blast furnaces by a rubber belt to eliminate the cost of loading, switching and unloading cars

To utilize the gas which would otherwise be wasted at the new blast furnaces, an electric power station will be built. Two turbo-generators of 25,000-kw. capacity each (one a spare) will be placed in a building which will also contain three turbo-blowers of 70,000 cu. ft. capacity for blowing the two new blast furnaces. The turbines mentioned

Plans Being Made to Entertain European Foundrymen

The Philadelphia Foundrymen's Association, at its monthly meeting Tuesday evening, Dec. 8, authorized its president to appoint a committee of 10 to 15 members to make plans to entertain visiting European foundrymen who will stop for two days in Philadelphia in September, 1926, on their way to the annual convention of the American Foundrymen's Association in Detroit. An effort will be made to arrange for visits to some of the more interesting plants in Philadelphia, such as those of the Baldwin Locomotive Works, Westinghouse Electric & Mfg. Co. and the Edward G. Budd Stanley G. Flagg, Philadelphia, who is one of the entertainment committee of the American Foundrymen's Association, presented the matter for the action of the association and expressed the hope that every possible effort would be exerted to reciprocate for the kindnesses shown to American foundrymen who have visited Europe.

Great Power Systems Open Markets

By Reducing Costs They Broaden Distribution—Interlocking Current for New England

BY JOHN NELSON

GREAT systems for generating and distributing power, which are constantly growing more immense as they merge their interests by ownership or by interchange of electric current, are having a farreaching influence on industry. Their constant effort is to open new markets for their power and to this end their distribution departments have been developed to a high degree of efficiency. The result is that whereever the power systems have established themselves they have made extensions, in always increasing complexity of ramification, until even a farm must be really isolated to be beyond the reach of the great benefits which come with electric lighting and power.

New England metal-working industries are so alive to this situation that a conference was held at Worcester Nov. 12 and 13 (THE IRON AGE, Nov. 26, page 1464) to discuss some of the problems. All branches of industry, trade and commerce in the six States were represented. Owen D. Young urged the pooling of all the power in the entire territory, to obtain results impossible with diffusion of effort.

Every household and every farm and every small industry which is added as a customer for the power company means another buyer through a long line of products, from the wiring of the building to the motor and washing machine and vacuum cleaner and the scores of other devices, motor driven or electrically heated, which American factories have developed on so vast a scale. Without these concentrations of capital and engineering skill and enterprise this market would be far behind what it is today.

The experience of one of the great electric machinery builders demonstrates the point. There are periods when the shops are turning out generating equipment in unusual volume, aggregating many horsepower. Invariably, it is stated, such a period is followed by an unusual volume of orders for motors and other apparatus required in putting power to work.

Isolated Plants Going Out

The small generating stations are disappearing. In the factories their place has been taken by electric motors; in the towns and villages, by the transformer stations which step down the current from high tension to commercial voltage. Taking it by and large, the current furnished by the "super-power" companies, so-called, is cheaper than could be generated and distributed from the small power unit, and it is more dependable. There are so many original sources of supply that no breakdown, outside of a broken transmission wire, can shut off the power.

A striking example of the benefits of a comprehensive power system is afforded in central New England. The New England Power Co., which was a pioneer in this work, develops several hundred thousand horse-power on the Connecticut and Deerfield rivers, is tied in with other hydraulic stations in the Adirondacks, and, which is most important, is tied in with the great steam power stations of the large cities, including that of the Edison Co. at Boston, and those at Worcester, Providence and Fall River.

As the work day ends and industrial customers shut down their plants, the current from hydraulic stations is switched to the great centers for lighting and to operate trolley lines, thus permitting steam plants to curtail their operations and save fuel. If water is low the steam plants supply the deficiency.

Taking the Gloom from the Farm

So mobile a power must necessarily tend to minimum rates. The distribution covers very completely a great territory. Thousands of farms and homes in

the country districts have light and power for which otherwise they would have had long to wait. The farms get their power cheaply. There are brightly lighted houses and barns which formerly knew only the gloomy dimness of candles and kerosene lamps and lanterns. Electric current supplies them power to expedite farming tasks, to offset some of the scarcity of labor and make easier the lot of the housewife. Here, as elsewhere, there is truth in the oft-repeated statement that the standard of living increases in the ratio of the power behind the man.

Electric power combines with the telephone, automobile, motor truck and radio to take from the farm the old monotony and lonesomeness; it leads men back to agricultural pursuits in a section of country where the trend has been too strongly cityward. The New England case is not exceptional. Like instances may be found all over the United States, and always they mean expanding markets for manufactured products.

The big power corporations are getting bigger, as has been said. Recent consolidations have brought the idea of one vast Eastern States power system another long step nearer realization, and further mergers are looked for. New capital is coming into the field, and one at least of recent Eastern mergers means the early development of hundreds of thousands of horsepower from waters now going to waste so far as power goes. Once harnessed, this power will be useful in extending still further the market for electrical equipment, in the manufacture of which a great diversity of industry is concerned. Another effect will be centralizing still more closely the buying of immense quantities of equipment and materials which go into building, equipping and maintaining power stations and transmission systems.

Hoover's Dream Coming True

Some years ago Secretary Hoover announced his intention to encourage the creating of a power system to cover all of the Eastern United States north of the Potomac River, by developing all of the large water powers and tying them in with all the existing big steam stations and others on a still larger scale to be established. The idea was considered by many to be that of a dreamer, which might come true some time in the far future.

Yet very much of the work has been done. The accomplishment of plans already in hand by private interests, for which money is available, for utilizing remaining undeveloped water power and building steam plants, will bring very near to completion the plan as outlined for Mr. Hoover by the special commission which studied his project for him. Government ownership is not necessary, nor perhaps desirable. Nor is one common ownership a requisite. The goal is a wide-spread, unified power system, with interchange of power on the most efficient and economical scale.

Production of electric power by public utility plants in the United States in October is reported at 5932 millions of kwhr., compared with 5483 in September and 5463 in August. This by far is the highest total of any month to date. If the remainder of the year follows the trend of previous years, the average month of 1925 will show a higher production than the highest month of any preceding year.

The annual Christmas dinner and entertainment of the Pittsburgh Foundrymen's Association, will be held Monday evening, Dec. 21, in the English room, Fort Pitt Hotel, Pittsburgh.

French Mills Extend Deliveries

Anticipated Taxes and High-Cost Raw Materials Also Lessen Competition—Franco-German Treaty Negotiations Reopened

(By Cablegram)

LONDON, ENGLAND, Dec. 15.

THE probability of a general steel tariff here is more remote, the investigating committee having reported unfavorably. Cleveland pig iron has been quiet since the recent increase of prices to an agreed minimum but hematite is moderately active and higher prices are being asked. The North Lonsdale Iron & Steel Co., Ltd., has blown in two furnaces, making 13 now in blast on the Northwest Coast. Foreign ore is dull but prices are firmer as a result of increased freight rates. Bilbao Rubio ranges from 21s. to 21s. 3d. c.i.f.

Finished steel inquiry is improving, especially on business for forward shipment, but demand for heavy material is still light. Staffordshire marked bars have been reduced 10s to £14 per ton on either domestic or export sales

The November exports of pig iron totaled 56,191 tons, of which the United States took 21,449 tons. Total exports of iron and steel were 322,188 tons.

Tin plate prices are easier with less buying and freer resale offering. Prices are down to 19s. 7½d., base, for prompt shipment, f.o.b. works, port accepted. Galvanized sheets are steady in a market providing a fair general demand. Black sheet demand is generally slow, Far East displaying little interest.

Improved inquiry for Continental material is re-ported, but business is difficult to negotiate because of extended shipments and higher prices asked by many Continental works. The German Wire Trust has been formed but is not yet operative. Negotiations for a Franco-German commercial treaty reopen in Paris this

FRENCH MILLS FULL

Deliveries Are Extended and Prices Firmer-Heavy Taxation Expected

PARIS, FRANCE, Dec. 4 .- A month ago, the present depreciation of the franc would have enabled French mills to book considerable export business, but today foreign purchasers are more guarded and French sellers are also inclined to hold back, having booked orders for two to three months ahead. Both producers and consumers fully realize that in the future there will be heavy taxes, which, together with the increase, through depreciation of the franc, of raw materials and labor will add considerably to production costs.

In the domestic market, consumers have continued to cover requirements well in advance, anticipating an expected increase in prices and the advance at an early date of railroad transportation rates.

Pig Iron.-Although December has hardly begun producers of phosphoric pig iron have no tonnage left for disposal this month as a result of both domestic and foreign buying. In addition most producers are sold up for the whole of January. As a result, the producers of phosphoric pig iron have increased quotations by 25 francs, effective Jan. 1, and the price of foundry pig iron No. 3 P. L. is 370 fr., f.o.b. works (\$13.36). The export pig iron market is less steady with a reduced demand, caused largely by the closing of certain outlets such as Italy, which intends consuming first whatever pig iron is produced locally. Prices are firmer on Belgian and Lorraine No. 3 foundry at 315 fr. (Belgian), \$14.24, f.o.b. Antwerp. Luxemburg furnaces are quoting about 5 fr. more. There is a strong demand for hematite, which would be even stronger if producers were willing to sell on long term contracts. Prices of hematite will probably be increased about 20 fr. in January.

Semi-finished Products.-The market is irregular,

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.85 per £, as follows:

Durham coke, del'd Bilbao Rubio ore†	£1	1s.	to	£1	1½s.	\$5.09	to	\$5.19
Cleveland No. 1 fdy.		9	and	3	91/2*	16.73	and	16.74*
Cleveland No. 3 fdy. Cleveland No. 4 fdy.	3	5 1/2	and		6*	16.00 15.88		16.00*
Cleveland No. 4 forge Cleveland basic	3	5	and	3	5 1/2 *	15.76 15.76	and	15.88*
East Coast mixed	3	151/2				18.29		
East Coast hematite. Ferromanganese	15	19				$\frac{24.00}{75.18}$		
*Ferromanganese	15	5		ò		73.96		20.00
Rails, 60 lb. and up					10	29.10	to	38.80
Sheets and tin plate			-					
bars, Welsh Tin plates, base box.		1984	to	1	0	30.31		4.90
the protect bases some	-	20 /4					C. per	
Ship plates	7	5	to	7	15	1.57		1.67
Boiler plates							to	
Tees	7	714	to	7	1716			
Channels					21/2	1.43	to	1.54
Beams					171/2		to	
Round bars % to 3 in.					736			
Steel hoops	10	10 8	nd					
Black sheets, 24 gage	11	5	to	11	10	2.44	to	2.67
Black sheets, Japanese		-	***					
specifications	15	5				3,30		
Galv. sheets, 24 gage.						3.57	to	3.61
Cold rolled steel strip.								
20 gage	18	0				3.90		-

Export price.		
Ex-ship, Tees,	nominal.	

Continental Prices, All F.O.B. Channel Ports

Farman of the same								
Foundry pig iron:(a) Belgium France Luxemburg Basic pig iron:(a)	2	19s. 19 19		£3	1s. 1	\$14.30 14.30 14.30	to to	\$14.80 14.80 14.80
Belgium France Luxemburg Coke Billets:	2	18 18 18 18	to to	20 22 22	0 0	14.05 14.05 14.05 4.37	to to	14.55 14.55 14.55
Belgium France Merchant bars:	44	$\frac{61_{2}}{61_{2}}$	to	4	$\begin{array}{c} 7 \ 1 / 2 \\ 7 \ 1 / 2 \end{array}$	20.97	to	21.22 21.22 er Lb.
Belgium Luxemburg France	101010	5 5 5	to to	151515	6 6	1.13 1.13 1.13	to	1.14
Joists (beams): Belgium Luxemburg France	4.4	18 18 18	to	4	19 19 19	1.06 1.06 1.06	to to	1.07 1.07 1.07
Angles: Belgium		18			19	1.06	to	1,07
Belgium	6	4 4	to	6	6	$\frac{1.34}{1.34}$		$\frac{1.36}{1.36}$
Belgium Luxemburg Sheets, heavy:	5	9	to		$\frac{12\frac{1}{2}}{12\frac{1}{2}}$	$\frac{1.17}{1.17}$	to	1.20 1.20
Belgium	6	3	to	6	4	1.33 1.33	to	1.34

especially for export. The price of blooms f.o.b. Antwerp is maintained at £4 1s. (\$19.65); billets £4 6s. (\$20.85); and slabs, £4 10s. (\$21.82).

Finished Material.-Firmness is a feature of the market, although there is an undertone of uncertainty caused by the fluctuations of exchange rates. Domestic orders are still numerous as consumers and merchants continue to stock up at present prices, protecting themselves against the advance of about 10 per cent in freight rates, effective Jan. 1. Prices vary according to size and the producing works. Bars range from 58 to 60 fr. per 100 kg. with occasional sales at 62 fr. liveries are seldom less than three months, except on beams, which are offered at six to eight weeks, and hoops on two months' delivery. Concrete bars and beams are quiet and the price of beams fluctuates be-Concrete bars and tween 55 and 57 fr. per 100 kg. For export, despite the advantage of the depreciated franc exchange, makers are not inclined to book business for long term deliveries. Beams are quoted at £4 16s. (\$23.27); bars at £5 4s. (\$25.21); and angles at £5 2s. 6d. (\$24.85). Some desirable orders have been taken for Japan.

Sheets.—This market shows some improvement and prices are 5 fr. per 100 kg. higher than 10 days ago. The following prices are being quoted, per 100 kg.: Heavy sheets, 68 to 70 fr.; medium, 90 to 92; thin, 105 to 108 fr. Delivery is more extended, varying from four to six weeks on heavy sheets, six to eight weeks on medium sheets and about three months on thin sheets. For export, prices on heavy sheets are £5 9s. (\$26.43) f.o.b. Antwerp, and on medium £6 to £6 6d. (\$29.10 to \$29.25).

Wire Products.—Although the price of wire rods has firmed up to £5 14s. to £5 14s. 6d. (\$33.88 to \$34.00) for export, the market has become quieter. In the domestic market, galvanized wire products are in active demand and bringing high prices.

BELGIAN BUSINESS BETTER

Reduced French Competition a Factor—Curtailment of Capacity Caused by Strike

Antwerp, Belgium, Dec. 5.— Demand continues poor and prospects for the future uncertain. In some quarters it is believed that the present firmness of certain products cannot be maintained because of the small demand. The competition of German makers is apparently growing stronger as they endeavor to fill their order books by making concessions on foreign business. French competition also continues as a factor in the Belgian market but is for the present at least less keen than in previous weeks, the larger French works being meanwhile rather well booked. While the depreciated franc is still a menace to anything resembling stable markets in Belgium, the momentary absence of keen French competition has permitted Belgian sellers to maintain their prices better and in some instances efforts have been made to obtain higher than the prevailing market.

Mills in the Liege district are well booked with tonnage, the strike in the Charleroi district still unsettled having reduced Belgian production by about 100,000 tons a month. This reduction in the capacity of the country has caused a considerable shortage of semifinished material, the gap, however, being filled satisfactorily for consumers with French material at prices that despite the high tariff are about equivalent to the quotations of Belgian mills. Although it is reported that the workers in the Charleroi district exhibit a desire to return to work, no satisfactory settlement of the wage demands has been found.

Finished Material.—Bars have been the most active of the finished steel products, the absence of competition from Charleroi makers contributing to price firmness. It is estimated that during the five months' duration of the strike in this district close to 500,000 tons of steel production has been lost. Although quotations of £5 5s. per ton (\$25.46) f.o.b. Antwerp have been made on bars, some business has been done at £5 4s. 6d.

(\$25.34) and as low as £5 4s. is reported possible on desirable orders, especially when French competition is encountered. Luxemburg makers are maintaining an even stronger market on bars, holding quite firmly to £5 5s. per ton (\$25.46) f.o.b. Antwerp. The domestic market is held at 580 to 590 fr. per metric ton, or about \$26.50 per ton on steel bars. Beams for export are quoted at £4 16s. 6d. to £4 18s. per metric ton (\$23.40 to \$23.76) f.o.b. Antwerp. Wire rods are firm with most Belgian mills out of the market for the present.

Semi-Finished Material.—Sellers are inclined to be firm except on very desirable business as in most cases they are well booked with business. Quotations f.o.b. Antwerp are: Billets, £4 8s. per metric ton (\$21.40); blooms, £4 2s. per metric ton (\$19.90); and slabs, £4 12s. per metric ton (\$22.35).

Pig Iron.—French competition is strong and current demand both for domestic consumption and export is light. The quotation of Belgian furnaces on high phosphorus foundry iron continues unchanged at 330 fr. per metric ton (\$15) delivered to consumers' works, or f.o.b. Antwerp. Export business, however, is reported to have been taken at as low as 315 fr. by French sellers and 320 to 325 fr. by Luxemburg furnaces. Semi-phosphorus iron with a phosphorus content of 1 per cent or less is quoted at \$16.50 per ton with iron analyzing 0.5 to 0.8 per cent phosphorus at \$18 per metric ton, f.o.b. Antwerp.

AUSTRIAN TRADE BETTER

Unemployment Decreases—Buying by Russia— Export Manufacturers Protected

VIENNA, Dec. 1.—The Austrian iron and steel industry has experienced fairly good selling conditions but extremely unsatisfactory prices during the third quarter of 1925. In general Austria's economic condition has improved. The adverse foreign trade balance in 1925 will be only about half that of 1924. Unemployment figures totaling about 132,000 in November are lower than for some time and the price index has declined during the past year from 144 to 125, reducing production costs, although wages have risen slightly. Mining of iron ore and coal in the third quarter exceeded second quarter production, but the output of pig iron, steel and rolled products decreased slightly. This was the result of a strike in the Donawitz works. Total production for nine months, to Sept. 30, was 765,330 metric tons of iron ore; 290,702 tons of pig iron and 345,194 tons of steel.

The average price of pig iron in the third quarter was 168.20 Austrian schillings (\$23.75), against 175 schillings (\$24.72) in the second quarter; billets, 217.50 schillings (\$30.72), against 226 schillings (\$31.92); bars, 275 schillings (\$38.84), against 301.60 schillings (\$42.60). These were average domestic prices and were the lowest reached since the war. The average wage paid to blast furnace workers in the third quarter was 10 schillings, and in the steel mills 8.68 schillings. To keep down production costs works were compelled to accept foreign orders at low prices. The domestic market for bars and structural shapes has been quiet as well as the high grade steel markets. Increasing orders for engineering products, however, have been coming from Russia and still better business is expected as result of the National Bank's recent decision to discount Russian bills.

The iron and steel industry, which actually is the Alpine Montan Gesellschaft, has come to an agreement with consuming manufacturers by which the import duty on bars is to be increased from 2.50 to 5 gold crowns and the producers will deliver bars to the manufacturers at world-market prices, provided the bars are used in the manufacture of products for export. A similar agreement is being negotiated for other iron and steel materials. This plan was first adopted in Germany by the Raw Steel Syndicate. It will help Austrian manufacturers to compete abroad, while increasing the prices of finished materials to domestic consumers.

Iron and Steel Markets

Railroad Demand a December Feature

More Than 5000 Cars Placed in the Week and Buying for Track Is

Large—Remarkable Year's Record in Tin Plate—

Finished Steel Ouieter at Year End

RAILROAD demand stands out in the new busings of the week as an offset to lessened buying by consuming industries which were actively in the market in November. More than 5000 steel cars were placed, mostly in the East, also several large contracts for track supplies, while considerable railroad inquiry has appeared for bars, plates and shapes for 1926 delivery.

Steel works operations are again fractionally larger, partly in anticipation of the coming holiday suspension. It is expected that operations will be on a good scale in the week between Christmas and New Year's, though some Central Western plants, notably those at Youngstown, will be down from Thursday noon, Dec. 24, until the end of next week.

December new business naturally is not expected to keep up the November rate, and hence the last month's increase in the Steel Corporation's booked tonnage will not be duplicated. The 473,000-ton gain was due in large part to the formal entering of rail orders previously announced and to the annual contract of the country's largest buyer of tin plate.

Equipment orders just placed by the railroads include 1550 freight cars by the New York Central, 1000 freight cars by the Reading, 1100 by the Lehigh Valley and smaller lots by other roads, bringing the total to 5325 cars. There are inquiries for 2850, of which 2000 are for the Union Pacific. Locomotives ordered total 75, the Wabash and St. Louis-San Francisco ordering 25 each, the Santa Fe 15 and the Chicago & North Western 10. The Florida East Coast is inquiring for 38 and the Missouri Pacific for 30.

The promise of large scale track work in 1926 is further borne out by late tie plate contracts—12,000 tons for the Pennsylvania, 18,000 tons for the New York Central and 10,000 tons for the St. Paul.

A B. & O. inquiry for the first half of 1926 calls for 8000 tons of bars, 6000 tons of plates and 3000 tons of shapes. The Norfolk & Western has closed for 2000 tons at 2c., Pittsburgh, for bars and shapes and 1.90c. for plates.

To hold down inventories, some consumers, particularly in automotive and wire-working lines, have limited deliveries in the remainder of the month. In other cases, with invoices below today's price level, shipments are going forward freely.

While automobile companies are planning good production over the first quarter, they may not maintain the rate of the present quarter. Meanwhile, the deadlock over the new prices for parts continues, though some makers of forgings and other parts have closed for first quarter supplies of steel.

Steel pipe is still the laggard among finished steel products, active capacity in the Pittsburgh and Youngstown districts being 60 to 65 per cent.

Oil country buying still waits on real improvement in the oil situation. The Texas Co. will buy 5000 tons of steel for cracking stills.

Tin plate output for 1925 bids fair to run 10 to 15 per cent above the best record, some estimates running above 38,000,000 boxes. This year's pack of vegetables is put at 65,000,000 cases, or 20 millions above the average of recent years.

A Northern Ohio mill has closed for 30,000 tons of sheet bars and small billets for the first quarter. At Pittsburgh semi-finished steel prices are especially firm and a number of consumers have sought piecing-out tonnages.

The pig iron market promises to run on into the new year with little change, as most buyers are well covered. Production of merchant iron increases slowly. In the Chicago district stocks at merchant furnaces are 60 per cent less than a year ago. Foreign iron moves steadily into Eastern foundry centers. At Philadelphia 12,000 tons was imported last week, half of it coming from England.

First quarter contracts for blast furnace coke, covering 75,000 to 100,000 tons a month, are a feature of the week. The price is thus fairly defined at \$4 a ton, which is somewhat below what producers started to ask. Spot coke is 25 cents higher this week, under increased demand for domestic

A French cast iron pipe maker was awarded 6000 tons for Detroit, but 11,000 tons was placed with two American companies, 9000 of this for centrifugally cast product. A German maker was low on 1000 tons for Providence, R. I.

THE IRON AGE composite prices are unchanged this week, that for pig iron being at \$21.54 for the third week, while finished steel remains at 2.453c. per lb., as one week ago.

Pittsburgh

Little Change in Buying or Operations— Contracting for First Quarter Coke

PITTSBURGH, Dec. 15.—The month to date has not provided so large accretions to backlog steel business as did the same period last month, but the explanation is to be found in a higher rate of production and heavier shipments than a month ago rather than in any material let down in buying. The inventory consideration is a factor in holding up shipments for the latter part of the month, but in many cases it is having no influence because the invoice prices are attractive in comparison with others now ruling. Furthermore, the end of the year is so near at hand that in many products the manufacturers would not be able to ship before January against new orders.

The week has brought no material change in steel

The week has brought no material change in steel plant operation and prices are holding at the levels of a week ago. The market has a very firm tone and is

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics At Date, One Week, One Month, and One Year Previous

For Early Delivery

Pig Iron, Per Gross Ton: Dec. 15,	Dec. 8, 1925	Nov. 17, 1925	Dec. 16, 1924	Sheets, Nails and Wire,	Dec. 15, 1925	Dec. 8, 1	Nov. 17, 1 1925	Dec. 16, 1924
No. 2X, Philadelphiat \$24.26	\$24.26	\$23.76	\$24.51	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
No. 2, Valley furnacet 20.50	20.50	24.67	21.00	Sheets, black, No. 28, P'gh	3.35	3.35	3.25	3.50
No. 2, Southern, Cin'tit. 25.69	25.69	25.05	24.05	Sheets, black, No. 28, Chi-				
No. 2, Birmingham, Ala.† 22.00	22.00	21.00	20.00	cago dist. mill		8.45	3.35	3.70
No. 2 foundry, Ch'go furn. 23.00	23.00	23.00	22.50	Sheets, galv., No. 28, P'gh	4.60	4.60	4.50	4.75
Basic, del'd, eastern Pa 23.00	23.00	22.50	23.50	Sheets, galv., No. 28, Chi- cago dist. mill		4.70	4.60	4.85
Basic, Valley furnace 20.00	20.00	20.00	21.00	Sheets, blue, 9 & 10, Pgh		2.50	2.40	2.70
Valley Bessemer del'd P'gh 22.76	22.76	22.76	23.76	Sheets, blue, 9 & 10, Chi-			21.20	
Malleable, Chicago furn. 23.00	23.00	23.00	22.50	cago dist. mill	2.60	2.60	2.50	2.80
Malleable, Valley 20.50	20.50	20.50	21.00	Wire nails, Pittsburgh	2,65	2.65	2.65	2.85
Gray forge, Pittsburgh 21.76	21.76 29.04	21.76	22.26 29.04	Wire nails, Chicago dist.	2.70	2.70	2.70	2.95
L. S. charcoal, Chicago 29.04 Ferromanganese, furnace115.00	115.00	29.04 115.00	105.00	Plain wire, Pittsburgh Plain wire, Chicago dist	2.50	2.50	2.50	2.60
Daile Dillete etc p a m				mill	2.55	2.55	2.55	2.70
Rails, Billets, etc., Per Gross Ton	:			Barbed wire, galv., P'gh.		8.35	3.35	3.55
Oh. rails, heavy, at mill. \$43.00	\$43.00	\$43.00	\$43.00	Barbed wire, galv., Chi-		9.40	9.40	9.45
Bess. billets, Pittsburgh 35.00	35.00	35.00	36.00	Tin plate, 100 lb. box, P'gi	3.40	3.40 35.50	\$5.50	3.65
Oh. billets, Pittsburgh 35.00	35.00	35.00	36.00	111 pieto, 100 10. 002, 1 8	40.00	40.00	40.00	40.00
Oh. sheet bars, P'gh 36.00	36.00	36.00	37.00	Old Material, Per Gross To	on:			
Forging billets, base, P'gh 40.00	40.00	40.00	42.50	Carwheels, Chicago		\$18.50	\$18.50	\$20.00
Oh. billets, Phila 40.30 Wire rods, Pittsburgh 45.00	40.30	40.30	41.67	Carwheels, Philadelphia .	18.50	18.50	18.50	19.00
	45.00			Heavy steel scrap, P'gh.	. 19.00	19.00	19.50	21.50
Cents				Heavy steel scrap, Phila.		17.50	17.50	20.00
Skelp, gr. steel, P'gh, lb 1.90	1.90	1.90	2.00	Heavy steel scrap, Ch'go.	. 15.50	15.75	16.00	18.75
Light rails at mill 1.65	1.65	1.65	1.80	No. 1 cast, Pittsburgh No. 1 cast, Philadelphia.		18.00	18.00	19.00 19.50
				No. 1 cast, Ch'go (net ton)		17.25	18.25	19.00
Finished Iron and Steel,				No. 1 RR. wrot, Phila		18.50	18.50	21.00
Per Lb. to Large Buyers: Cents	Cents	Cents	Cents	No. 1 RR. wrot. Ch'go (net	13.75	14.00	15.75	16.50
Iron bars, Philadelphia 2.22	2.22	2.22	2.32	C-1- C				
Iron bars, Chicago 2.00	2.00	1.95	2.00	Coke, Connellsville,				
Steel bars, Pittsburgh 2.00	2.00	2.00	2.10	Per Net Ton at Oven:				
Steel bars, Chicago 2.10	2.10	2.10	2.10	Furnace coke, prompt	. \$3.75	\$3.50	\$5.00	\$3.75
Steel bars, New York 2.34	2.34	2.34	2.44	Foundry coke, prompt	. 5.00	4.75	6.00	4.50
Tank plates, Pittsburgh 1.90	1.90	1.90	1.90	W-4-1-				
Tank plates, Chicago 2.10	2.10	2.10	2.20	Metals,				
Tank plates, New York 2.04	2.04	1.94	2.24	Per Lb. to Large Buyers	: Cents	Cents	Cents	Cents -
Beams, Pittsburgh 1.90 Beams, Chicago 2.10			2.10 2.20	Lake copper, New York.		14.25	14.62%	
Beams, Chicago 2.10 Beams, New York 2.24		2.10	2.20	Electrolytic copper, refiner			4 14.874	14.25
Steel hoops, Pittsburgh 2.50			2.50	Zinc, St. Louis		8.75	8.45	7.55
	4.00	2.00	2.00	Zinc, New York Lead, St. Louis	. 8.90	9.00	9.50	9.8714
*The average switching charge in the Chicago district is 61c. per t †Silicon, 1.75 to 2.25. ‡Silicon,	on.		foundries	Lead, New York Tin (Straits), New York. Antimony (Asiatic), N. 1	. 9.25	9.25	9.85 63.62 1/2 20.00	9.62 14

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

THE IRON AGE Composite Prices

Finished Steel

Dec. 15, 1925, 2.453c. Per Lb.

One	week	ago.				6	0		4	9			,9					0		0		2.453c.
One	month	ago				٠						0	۰		0					۰	0	2.439c.
One	year	ago.														۰			0	0	0	2.531c.
10-у	ear pr	e-wa	r	a	V	0	r	R	g	e							v					1.689c.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute \$8 per cent of the United States output of finished steel.

	High			Low											
1925	2.560c.,	Jan.	6	2.396c.,	3/	Aug.	18								
1924	2.789c.,	Jan.	15	2.460c.,		Oct.	14								
1923	2.824c.,	April	24	2.446c.,		Jan.	2								

Pig Iron

Dec. 15, 1925, \$21.54 Per Gross Ton

One	week	ago.	0 1					0		0			9	0	0	0		0		0	0	0		821.54
One	month	ago	0	0. 1		9		0	0	9						0	9							21.29
One	year a	igo		m :		*	×	×	*	*	ė							*	*				×	21.67
10-y	ear pro	-war	-	BY	ve	r	£	e				0				6				ú				15.78

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

	High	h		Low									
1925 1924 1923	\$22.50, 22.88, 30.86,	Jan. Feb. March	26	\$18.96, 19.21, 20.77,	July Nov. Nov.	7 3 20							

even strong on semi-finished steel, because a good many consumers do not believe they have sufficient coverage on their contracts with their regular sources of supply and are seeking supplementary tonnages. Makers of semi-finished steel appear to have little available for first quarter shipment and are disposed to ask higher prices for any steel they have beyond their contract requirements.

The past week has brought out the first contracting for first quarter tonnages of furnace coke, and the market has become rather well defined on the basis of \$4 per net ton at ovens. It is estimated that between 75,000 and 100,000 tons a month have been closed for that period. This business coupled with a circumstance. for that period. This business coupled with a stronger demand for crushed coke as a substitute for anthracite

has brought about a stronger spot market, with prices

25c. a ton higher than they were a week ago.

Outside of the sale of a fair sized tonnage of basic iron, the pig iron market has shown no unusual activity but prices still are firmly maintained. Activity in scrap in the Youngstown district is a helpful factor

rin sustaining local prices.

Pig Iron.—Sales of about 10,000 tens of basic iron for delivery starting immediately and running through the first quarter of next year are noted to an eastern Ohio steel maker at the full recent quotation of \$20, Valley furnace. The United States Cast Iron Pipe & Foundry Co., which recently inquired for its first quarter requirements of foundry iron for its Scottdale, Ps., plant, which amounted to about 10,000 tons a month, plant, which amounted to about 10,000 tons a month,

is reported to have closed but the purchase was made in the East and details as to prices are not available. Outside of these transactions the week's business has continued to be chiefly of small lot tonnages for early delivery. Melters continue to take out iron freely on old orders and most producers are shipping well in excess of their production and consequently cutting down their large stocks. Prices are firm at recent levels.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic							 				!	\$20.00
Bessemer					* *		 					21.00
Gray forge							 					20.00
No. 2 foundry		× +					 					20.50
No. 3 foundry							 					20.00
Malleable					6 ×		 					20.50
Low phosphoru	IS.	CO	pp	er	fre	ee.	 	\$2	8.0	00	to	28.60

Ferroalloys.—This market is notable more for its firmness than activity. With several domestic sources of supply of ferromanganese, consumers no longer feel the necessity of buying so far ahead as when their dependence was largely on foreign material. The price is firm at \$115, Atlantic seaboard, on either domestic or foreign material. Activity in high grade ferrosilicon and in spiegeleisen is chiefly in specifications against contracts. Prices are given on page 1697.

Semi-Finished Steel.—The fear that they have not covered themselves as fully as they should is still strong among the non-integrated manufacturers, and there are many inquiries for additional tonnage for early 1926 delivery. Most producers have covered their regular customers to the extent of their regular requirements, and in some instances beyond, and naturally are not actively seeking further obligations. The combination of circumstances means a firm market and the possibility of higher prices in the event the manufacturers who buy their steel find it necessary later to supplement contract shipments by fresh purchases. So far as this and immediate territory is concerned, no business has yet been done at more than \$35, Pittsburgh or Youngstown, for large billets and slabs, and \$36 for sheet bars and small billets and slabs. Wire rods are moving steadily and the ruling price still is \$45, base Pittsburgh or Cleveland. The open market in skelp is a limited one. Prices are given on page 1697.

Wire Products.—The close proximity of inventory time is causing some holding up of shipments of nails, but general business in wire and wire products is regarded with satisfaction, as there is a steady flow of early 1926 orders and, with the turn of the new year, business is expected to gather momentum. There seems to be no interruption in the demand for plain wire, and shipments are holding up well. Lumber statistics, to which nail manufacturers turn as a guide to nail requirements, show shipments about 15 per cent greater than last year. Farm prosperity is counted on to bring about a good spring business in barbed wire and fence. Prices are firm. They are given on page 1695.

Rails and Track Supplies.—An interesting development is an appreciable gain in the demand for small spikes; the recent improvement in soft coal mine operations appears to have produced a demand that has largely reduced stocks in second hands, which must now be replenished. Makers are filling up steadily on large spike business for early next year. The 1926 track laying program is a large one, promising good business in the accessories. Light rails are selling steadily, but not in volume, and efforts to put up prices are not meeting with much success. Prices are given on page 1695.

Sheets.—As most mills are well sold into the first quarter, prices announced for that period are being well observed. This does not mean that every ton of business now being entered carries the full quotations, but deviations are few and are being made by mills accounting for but a small part of the country's capacity. Except in times of unusual demand, there are some mills that for one reason or another will quote below the prices of the majority. There is a little less eagerness for shipments over the next few weeks, but

that is to be expected in view of inventory considerations, and, meanwhile, first quarter contracts are coming along steadily. Prices are given on page 1695.

Tin Plate.—Consumers have fairly well completed calculations as to their requirements for the first half of 1926, and the mills now know what is expected of them. The leading producer already is operating very close to physical capacity, having all mills in 11 of its 12 tin plate plants running, and some of the independent companies are not far behind. The promise for 1926 is bright, but there is doubt that it will surpass this year in either production or shipments. This year's pack of peas, corn and tomatoes reached the amazing total of approximately 65,000,000 cases, or about 20,000,000 cases above the average of recent years. Unless there is a corresponding gain in consumption, there is a possibility of prices low enough to discourage so large a production and pack in 1926. This year's output of tin plate is estimated to be 10 to 15 per cent greater than in any other year in the history of the industry, or between 37,000,000 and 38,000,000 base boxes.

Cold-Finished Steel Bars and Shafting.—Although some of the automobile parts makers are holding up shipments for late this month, general business, taking in current demands and contracts for first quarter tonnages, is making a favorable showing and continuing the November record of exceeding completed business. Present quotations are well observed.

Hot-Rolled Flats.—This line has felt the approach of the inventory period, but not in an unusual way. Makers are well supplied with early 1926 business and expect present hesitancy to pass with the completion of inventories. Prices are firm on narrow material and at least steady on wide stock. They are given on page 1695.

Cold-Rolled Strips.—Some lessening in the urgency for shipments is ascribed to the time of year. Makers are well supplied with early 1926 business and the flow of orders for shipment after the turn of the year is steady. Prices are firm, but efforts to advance them are not successful.

Steel and Iron Bars.—Steel bar business continues very satisfactory and producers are just as strong as ever as to prices. Makers of cold-finished steel bars are specifying very freely on contracts and there are few mills that now are very anxious for business calling for delivery over the next six weeks. Iron bars are steady and demand is improving because of larger railroad car orders. Prices are given on page 1695.

Structural Steel.—The 2c. price on large structural shapes is becoming more common, but the large tonnages and the weight of the total tonnage still are at 1.90c, base. Not much structural steel business is being placed in this district, but the inquiries are numerous and the fabricating companies are counting heavily on public buildings, railroad terminals and bridges to make good any falling away in 1926 in other kinds of construction. Plain material prices are given on page 1695.

Plates.—Local railroad car building companies got a fair share of the recent orders and are increasing their operation and taking out more steel. The leading local plate makers are well supplied with business and are firm as to prices. The effort still is to put the market on a minimum of 2c. base, Pittsburgh, but that price still is largely a hope so far as fair sized tonnages are concerned. Prices are given on page 1695.

Tubular Goods.—Consumption of standard pipe still is large for the season and there is a very good demand for it for direct shipment from the mills. There is still a tendency to keep down purchases for stock, and oil country goods still are rather sluggish, not only for inventory reasons, but because the producers are waiting on real improvement in the oil situation before completing 1926 drilling plans. Oil prices still are showing an upward tendency and pipe makers are hopeful that this means an early increase in drilling operations. Pipe making capacity in this and nearby districts is about 60 to 65 per cent engaged. The boiler tube market still leaves much to be desired both as to demand and prices. Discounts are given on page 1695.

Prices of Finished Iron and Steel Products (Carload Lots)

Iron and Steel Bars Soft Steel	Sheets Blue Annealed	Track Equipment
Base Per Lb.	Base Per Lb.	Base Per 100 Lb.
F.o.b. P'gh mills	Nos. 9 and 10, f.o.b. Pittsburgh	Spikes, \$\frac{1}{2}\$ in. and larger
F.o.b. Birmingham	Box Annealed, One Pass Cold Rolled No. 28, f.o.b. Pittsburgh	Angle bars 2.78 Welded Pipe
Diller Great Debuterates	No. 28, del'd Phila'phia	
Billet Steel Reinforcing F.o.b. Pittsburgh mills2.00c. to 2.10c.	Galvanized	Base Discounts f.o.b. Pittsburgh District and Lorain, Ohio, Mills Butt Weld
Rail Steel	No. 28, f.o.b. Pittsburgh	Steel Iron
F.o.b. mill	No. 28, del'd Phila'phia4.82c. to 4.92c.	Inches Black Galv.
Iron	Tin Mill Black Plate	% 60 48½ 1 to 1½ 30 18
Common iron, f.o.b. Chicago	No. 28, f.o.b. Pittsburgh	Lap Weld
Common iron, del'd New York2.24c.	Automobile Body Sheets	2 55 43¼ 2 23 7 2½ to 6 50 47½ 2½ 26 11
Tank Plates Base Per Lb.	No. 22, f.o.b. Pittsburgh4.50c.	2 55 48 ½ 2 23 7 2 ½ to 6 50 47 ½ 2 ½ 26 11 7 and 8 56 48 ½ 3 to 6 28 18 9 and 10 54 41 ½ 7 to 12 26 11 11 and 12. 53 40 ½
F.o.b. Pittsburgh mill1.90c. to 2.00c.	Long Ternes	
F.o.b. Chicago 2.10c. F.o.b. Birmingham 2.05c. to 2.15c. Del'd Cleveland 1.99c. to 2.09c. Del'd Philadelphia 2.02c. to 2.12c.	No. 28, 8-lb. coating, f.o.b. mill4.85c.	Butt Weld, extra strong, plain ends 16 41 241/4 2 to 8 61 801/4 16 to % 47 801/4 1/4 to %+11 +54
Del'd New York	Tin Plate Per Base Box Standard cokes, f.o.b. P'gh district mills\$5.50	16 to
Structural Shapes	Standard cokes, f.o.b. Gary and Elwood, Ind	Lap Weld, extra strong, plain ends
F.o.b. Pittsburgh mill		21/6 to 4 57 461/6 21/6 to 4 29 18
F.o.b. Chicago	Terne Plate	4½ to 6 56 45½ 4½ to 6 28 14 7 to 8 52 39½ 7 to 8 21 7
Del'd Cleveland	(F.o.b. Morgantown or Pittaburgh)	2 58 42½ 2 28 9 2½ to 4 57 46½ 2½ to 4 29 15 4½ to 6 56 45½ 4½ to 6 28 14 7 to 8 52 89½ 7 to 8 21 7 9 and 10 45 82½ 9 to 12 16 2 11 and 12. 44 81½
Del'd Philadelphia	(Per package, 20 x 28 fn.)	To the large jobbing trade the above discounts
C.i.f. Pacific ports2.35c. to 2.40c.	8-lb. coating, 100 1b. base\$11.40 8-lb. coating I.C. 11.70 8-lb. coating I.C. 11.70 8-lb. coating I.C. 19.45	on steel pipe are increased (on black) by one
Hot-Rolled Flats (Hoops, Bands and Strips)	15-15. coating I.C. 14.85 40-15. coating I.C. 21.65	point, with supplementary discount of 5 % and (on galvanised) by 1½ point, with supplementary discount of 5%. On iron pipe, both black and galvanised, the preferentials to large jobbers are 1, 5 and 2½% beyond the above
All gages, narrower than 6 in., P'gh2.50c.	Alloy Steel Bars	discount. Note.—Chicago district mills have a base two
All gages, 6 in. and wider, P'gh2.30c. All gages, 6 in. and narrower, Chicago2.60c. All gages, wider than 6 in Chicago2.50c.	S. A. E. Series Numbers Base Per 100 Lb.	points less than the above discounts. Chicago delivered base 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago dis- trict mills, the billing being from the point
Cold-Finished Steel Base Per Lb.	2100* (1/4% Nickel, 0.10% to 0.20% Carbon)	producing the lowest price to destination.
Bars, f.o.b. P'gh mills	2500 (5% Nickel)	Boiler Tubes
Bars, Cleveland2.56c. Shafting, ground, f.o.b. mill2.70c. to 3.00c.	3200 (Nickel Chromium) 5.25 to 5.85	Base Discounts f.o.b. Pittsburgh
Strips, f.o.b. P'gh mills	3300 (Nickel Chromium) 7.25 to 7.85 3400 (Nickel Chromium) 6.50 to 6.60 to 6.100 (Chromium Steel) 8.60 5200 (Chromium Steel) 7.50 to 8.25	Lap Welded Steel Charcoal Iron 2 to 2½ in
*According to size.	6100 (Chrom. Vanadium bars) 4.30 to 4.40 6100 (Chrom. Vanad. spring steel) 8.85 9250 (Silicon Manganese spring	Beyond the above discounts, 5 to 7 fives extra
Wire Products	steel) 3.25 to 3.30 Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.) 4.20 to 4.45	are given on lap welded steel tubes and 2 to 8 tens on charcoal iron tubes.
(To jobbers in car lots f.o.b. Pittsburgh and Cleveland) Base Per Keg Wire nails	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.) 4.55 to 4.65 Chromium Molybdenum bars (0.80—	Standard Commercial Beamless Boiler Tubes
Galv'd nails, 1-in, and longer 4.65	1.10 Chrom., 0.25—0.40 Molyb.) 4.35 to 4.45 Chromium Molybdenum bars (0.50—	Cold Drawn 1 in 60 3 in 45
Galv'd nails, shorter than 1 in	0.70 Chrom., 0.18—0.25 Molyb.) 3.80 to 3.80 Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molyb.)	1½ to 1½ in 52 8½ to 3½ in 47 1½ in 86 4 in 50 2½ in 81 2½ to 2¼ in 81 4½, 5 and 6 in 45 2½ to 2¼ in 89
Bright plain wire, No. 9 gage\$2.50	Above prices are for hot-rolled steel bars,	
Annealed fence wire	forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For bil- lets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same anal-	Hot Rolled 2 and 2¼ in 84 8¼ and 8¼ in 50 2½ and 2¾ in 42 4 in 58 3 in 48 4¼, 5 and 6 in 48
Barbed wire, galv'd	ysis. For billets under 4 x 4 in. down to and including 21/2-in. squares, the price is \$5 a gross	Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than
prices are \$1 per ton above the foregoing. Bir- mingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant, and Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.	*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.	tandard. No extra for lengths up to and in- cluding 24 ft. Sizes smaller than I in. and lighter than standard gage to be held at me- chanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.
Woven Wire Fence	Rails	
Base to Retailers Per Net Ton	Per Gross Ton Standard, f.o.b. mill	Seamless Mechanical Tubing (New List)
F.o.b. Pittaburgh	Light (from billets), f.o.b. mill1.68c. to 1.70c. Light (from billets), f.o.b. Ch'go mill, 1.80c. to 1.90c. Light (from rail steel), f.o.b. mill1.50c. to 1.60c.	Carbon, 0.10% to 0.30%, base
	1695	

Bolts, Nuts and Rivets.—There is a very steady market in bolts and nuts, both in respect to orders and prices. Contracts for first quarter supplies are coming along very steadily. Rivet makers in this district are holding firmly to recent prices, although buyers are disposed to work out lower priced purchases before ordering more. Greater activity of local railroad car shops is expected to bring out some rivet business. Prices and discounts are given on page 1697.

Coke and Coal.—The coke market has taken a stronger turn since a week ago and is quotable 25c. a ton higher on both furnace and foundry grades for spot shipment. There is no definite sign yet that the anthracite strike is nearing an end and cooler weather is responsible for heavier fuel consumption. The result has been a stronger demand for crushed coke to replace hard coal and prices are stronger. Lately Connellsville operators have been getting \$5 per net ton at ovens for yard crushed 48-hr. coke and as high as \$6 for regularly prepared domestic sizes. These prices are profitable and with the demand again good producers naturally can take a stronger stand on coke for metallurgical purposes. In the past week there has been a good deal of contracting for first quarter tonnages of furnace coke and it is estimated that between 75,000 and 100,000 tons a month have been closed at prices ranging from \$3.90 to \$4.10, with \$4 the ruling quotation. There is still some shortage of slack coal, prices of which are firm, but demand for other grades is no tax upon the supply and prices are easy. Prices are given on page

Old Material.—Some large purchases of heavy melting steel by Youngstown district mills at \$19.50 and \$20 have tended to arrest a weaker tendency in this market. Locally business still is quiet, but dealers cannot ignore the strength and activity of outside markets in their calculations and their price ideas are also buoyed up by the belief that at the present rate of ingot production the manufacturers must be eating into scrap stocks at a rate that will force early purchases. This market is firm at \$19 to \$19.50 for heavy melting steel; a week ago it was easy at that range. Machine shop turnings are weak, but the market is firm on short turnings and cast iron borings, due to blast furnace demands. There is no occasion to change prices of compressed and hand bundled sheet sides and ends. compressed sheets recently sold at \$16.75 at originating point, sold at a profit for delivery to a point with a freight charge of \$1.40 a ton. Low phosphorus billet and bloom crops are wanted and dealers are offering \$25 for them. Cast scrap is easy and \$22 now seems to be the top on steel foundry grades of railroad scrap.

We quote for delivery to consumer's mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

reight rate as follows:			
Per Gross Ton			
Heavy melting steel	\$19.00	to	\$19.50
No. 1 cast, cupola size			
Cambridge, Ohlo; Cumberland,			
Md.; Huntington, W. Va., and Franklin, Pa.	20.50	+0	21.50
Compressed sheet steel	18.00		18.50
Bundled sheets, sides and ends.	17.00		
Railroad knuckles and couplers	21.50		
Railroad coil and leaf springs	21.50		
Low phosphorus blooms and bil-	21.00	LU	22.00
let ends	24.00	to	24.50
Low phosphorus plates and other			
material	23.00	to	23.50
Low phosphorus punchings	21.00	to	21.50
Railroad malleable	19.50	to	20.00
Steel car axles	23.00	to	23.50
Cast iron wheels	18.50	to	19.00
Rolled steel wheels	22.00	to	22.50
Machine shop turnings	14.00	to	14.50
Short shoveling turnings	15.00		
Sheet bar crops	20.50	to	
Heavy steel axle turnings	17.00		
Short mixed borings and turnings	15.00		
Heavy breakable cast	17.00		
Stove plate	14.50		
Cast iron borings	15.00		
No. 1 railroad wrought	15.00		
No. 2 railroad wrought	19.00	to	19.50

The number of hoists ordered in November was nearly 11 per cent more than the number ordered in October, according to the records of the Electric Hoist Manufacturers' Association. In value the increase of November over October was about 2½ per cent.

STEEL IMPORTERS ACTIVE

Billets, Rails and Bars Among Current American Inquiries—Japan Asks for Pipe

New York, Dec. 15.—Considerable activity has recently featured the market for imported steel. American consumers are apparently interested in a wide range of products and among the current inquiries, on which prices have either been submitted or importers are awaiting cabled quotations, are several calling for sizable tonnages. In addition to the 5500 tons of rails for the Interborough Rapid Transit Corporation, mentioned last week, it is stated that a railroad in the East is accepting foreign bids on 10,000 to 15,000 tons of heavy rails. Another large tonnage inquiry is understood to be for about 10,000 tons of open-hearth forging billets for the Ford interests.

A fair volume of purchasing is reported, principally of plain and deformed steel bars, both Thomas and open-hearth qualities being mentioned in sales. One such lot of deformed steel bars was sold by a New York importer to a concern in Washington. A mill in the New England district is stated to have closed recently with a German mill for a sizable tonnage of wire rods and a manufacturer in the South has purchased about 500 tons of bars to be shipped from Germany. Purchasing by consumers in Florida has brought some business to importers, among recent bookings being about 1500 spools of barbed wire sold by a New York importer representing German mills.

Prices quoted by the representatives of European steel mills continue fairly firm at 1.70 to 1.75c. per lb., c.i.f. Atlantic port, duty paid on bars of intermediate grade, Thomas steel with open-hearth quality ranging

up to 1.95c. per lb., duty paid.

With the exception of small sales mounting to a fair total of business, the export market is quiet. Continued interest in small lots of tin plate is evident in the Japanese and Chinese markets and there is some inquiry from South American markets for this product, one such inquiry from Brazil calling for 400 to 500 boxes of wasters. A Japanese inquiry for tin plate wasters specifies 1000 base boxes of oil can size and several other smaller lots are in the market from both Japan and China. Prospective buyers, however, are not inclined to pay the current market prices asked by American sellers. In the case of the Japanese inquiry for 1000 boxes of wasters, the price idea of the purchaser is apparently about \$4.50 per base box, c.i.f. Japan.

One sizable inquiry from a large Japanese interest is 253,000 ft. of galvanized gas tubing, for which the Toho Gas Co. is in the market. Tokio municipality is inquiring for three miles of 91-lb. high T-rails and accessories, bids on which open tomorrow. Quotations submitted on inquiries from Japan for sheets lately have not resulted in business, although as low as \$83 per ton, c.i.f. Japan has been submitted by exporters. In this connection it is noteworthy that reports are to the effect that a tariff on sheets and rails will shortly be levied. The present tariff is an ad valorem duty of 15 per cent, and it is expected that the tariff will be raised to 20 per cent or higher, probably to protect the increased sheet manufacturing of the country and the Imperial Steel Works increased rail capacity.

Reduced Freight Rates In Effect From Southern Ohio

WASHINGTON, Dec. 15.—The Interstate Commerce Commission having declined to suspend them, tariffs reducing rates on pig iron from southern Ohio furnaces to Louisville, Ky., and points in Indiana north of the Ohio River, went into effect last midnight. The reduction made is from \$3.38 to \$2.65 per gross ton. Request for suspension of the tariffs had been made by the Chesapeake & Ohio and Norfolk & Western Railroads.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Semi-Finished Steel F.o.b. Pittsburgh or Youngstown

	F.o.b. Pittsburgh or Toungstown	
Billets and Blooms	Slabs	Wire Rods
Per Gross Ton	Per Gross Ton	Per Gross Ton
Rolling, 4-in. and over\$35.00	8 in. x 2 in. and larger\$35.00	*Common soft, base, No. 5 to %-in\$45.00 Common soft, coarser than %-in\$2.50 over base
Rolling, 2-in. and smaller 36.00	6 in. x 2 in. and smaller 36.00	Serew stock 45 00 per ton over base
Forging, ordinary 40.00		Carbon 0.20% to 0.40%. 3.00 per ton over base Carbon 0.20% to 0.55%. 5.00 per ton over base Carbon 0.68% to 0.75%. 7.50 per ton over base Carbon 0.68% to 0.75%. 10.00 per ton over base Carbon over 0.75%. 10.00 per ton over base Acid
Forging, guaranteed 45.00	Skelp	Carbon 0.56% to 0.75% 7.50 per ton over base
Sheet Bars	Per Lb.	Carbon over 0.75% 10.00 per ton over base
Per Gross Ton	Grooved1.90c.	Acid 15.00 per ton over base
	Sheared1.90c.	*Chicago mill base is \$46. Cleveland mill
Open-hearth or Bessemer\$36.00	Universal	base, \$45.
	Raw Materials	
0	W	Elementaria
Ores	Ferromanganese	Fluxes and Refractories
Lake Superior Ores, Delivered Lower Lake	Per Gross Ton	Fluorspar
Ports Per Gross Ton	Domestic, 80%, furnace or seab'd\$115.00 Foreign, 80%, Atlantic or Gulf port,	Per Net Ton
Old range Bessemer, 51.50% iron\$4.55	duty paid	Domestic. 85% and over calcium fluoride,
Old range non-Bessemer, 51.50% iron 4.40	Spiegeleisen	not over 5% silica. gravel, f.o.b. Illinois
Mesaba Bessemer, 51.50% iron 4.40 Mesaba non-Bessemer, 51.50% iron 4.25		and Kentucky mines
High phosphorus, 51.50% iron 4.15	Per Gross Ton Furnace	Foreign, 85% calcium fluoride, not over 5%
Foreign Ore, c.i.f. Philadelphia or Baltimore	Domestic, 19 to 21%	silica, c.i.f. Atlantic port, duty paid,
Per Unit	Electric Ferrosilicon	\$17.00 to \$17.50 Domestic, No. 1 ground bulk, 95 to 98%
iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian. 9.50c. to 10c.		calcium fluoride, not over 21/2% silica,
Iron ore, Swedish, average 66% iron9.50c.	Per Gross Ton Delivered	f.o.b. Illinois and Kentucky mines\$32.50
Manganese ore, washed, 51% manganese, from the Caucasus	50%	
Manganese ore, Brazilian or Indian, nom-	Per Gross Ton Per Gross Ton	Fire Clay
inal	Per Gross Ton Furnace 10%\$\frac{Furnace}{242.00}\$ 12%\$\frac{12\pi}{42.00}\$ 14 to 16\pi, \$\frac{45}{345}\$ to 46.00	Per 1000 f.o.b. Works
Tungsten ore, high grade, per unit, in 60% concentrates	10%\$42.00 12%\$42.00	High Duty Moderate Duty
Per Ton		Pennsylvania\$48.00 to \$46.00 \$40.00 to \$43.00
Chrome ore, Indian basic, 48% Cr ₂ O ₅ , crude, c.i.f. Atlantic seaboard\$22.50 to \$24.00	Bessemer Ferrosilicon	Maryland 48.00 to 50.00 48.00 to 45.00
Per Lb.	F.o.b. Jackson County, Ohio, Furnace	Ohio 48.00 to 46.00 40.00 to 48.00
Molybdenum ore, 85% concentrates of	Per Gross Ton Per Gross Ton 10%\$35.00 12%\$89.00	Kentucky 43.00 to 45.00 40.00 to 43.00
MoS ₂ , New York	10%\$35.00 12%\$89.00 11%87.00	Illinois 43.00 to 45.00 40.00 to 43.00 Missouri 40.00 to 43.00 35.00 to 38.00
Coke		Ground fire clay, per ton 6.50 to 7.50
Furnace, f.o.b. Connellsville	Silvery Iron	
prompt \$3.75 to \$4.00	F.o.b. Jackson County, Ohio, Furnace	Silien Brick
Foundry, f.o.b. Connellsville prompt 5.00 to 5.50	Per Gross Ton Per Gross Ton 827.50 10%	Per 1000 f.o.b. Works
Foundry, by-product, Ch'go ovens 19.50	7% 28.50 11% 85.00 8% 29.50 12% 87.00	Pennsylvania
Foundry, by-product, New Eng-	7% 28.50 11% 85.00 8% 29.50 12% 87.00	Chicago 49.00
land, del'd	9% 81.00	Birmingham 54.00
del'd 11.53	Other Ferroalloys	Silica clay, per ton\$8.00 to \$.06
Foundry, Birmingham 5.75 Foundry, by-product, St. Louis or	Ferrotungsten, per lb. contained metal,	
Granite City 10.00	del'd\$1.15 to \$1.20 Ferrochromium, 4% carbon and up, 60 to	Magnesite Brick
Coal	70% Cr., per lb. contained Cr. deliv-	Per Net Ton.
Per Net Ton	Ferrovanadium, per lb. contained vanadium,	Standard size, f.o.b. Baltimore and
Mine run steam coal, f.o.b. W. Pa.	f.o.b. furnace	Chester, Pa
mines	Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads\$200.00	Chester, Pa 40.08
mines 2.00 to 2.25 Mine run gas coal, f.o.b. W. Pa.	Ferrophosphorus, electrolytic, or blast fur-	
Mine run gas coal, f.o.b. W. Pa. mines 2.00 to 2.25	nace material, in carloads, 18%, Rock-dale, Tenn., base, per net ton	Chrome Brick
Steam slack, f.o.b. W. Pa. mines 1.40 to 1.50	Ferrophosphorus, electrolytic, 24%, f.o.b.	Per Net Ton.
Gas slack, f.o.b. W. Pa. mines 1.50 to 1.60	Anniston, Ala., per net ton\$122.50	Standard size
R	olts, Nuts, Rivets and Set Screv	WS.
ь	orto, Ituto, Auveto and Det Delet	The second secon
Bolts and Nuts	Bolts and Nuts	Large Rivets
(F.o.b. Pittsburgh, Cleveland, Birmingham and	(Quoted with actual freight allowed up to but	Base Per 100 Lb.
Chicago)	not exceeding 50c. per 100 lb.)	F.a.b. Pittsburgh
Per Cent Off List Machine bolts, small, rolled threads60 and 10	Per Cent Of List	F.o.b. Cleveland
Machine bolts, all sizes, cut threads50, 10 and 10	Semi-finished hexagon nuts:	F.o.b. Chicago 2.75
Carriage bolts, smaller and shorter, rolled threads	% in. and larger, U. S. S	
threads	% in. and larger, U. S. S	Small Rivets
Eagle carriage bolts	Stove bolts in packages80, 10 and 5	Per Cent Off List
Lag bolts	Stove bolts in bulk	F.o.b. Pittsburgh
(Extra of 20% for other style heads)	Tire bolts	F.o.b. Cloveland
Machine bolts, e.p.e. and t. nuts, % x 4 in., 45, 10 and 5	Semi-Finished Castellated and Slotted	F.o.b. Chicago70, 10 and 5 to 70 and 10
Larger and longer sizes45, 10 and 5	Nuts	Cap and Set Screws
Bolt ends with hot-pressed nuts50, 10 and 10	(Actual freight allowed up to but not exceeding	
Bolt ends with cold-pressed nuts45, 10 and 5 Hot-pressed nuts, blank and tapped, square,	50c. per 100 lb.)	(Freight allowed up to but not exceeding 50c, per 100 lb.)
4c. off list Hot-pressed nuts, blank or tapped, hexagons,	(To jobbers and consumers in large quantities)	Per Cent Off Liet
4.40c. off list	Per 100 Net Per 100 Net	Milled cap serews
C.p.c. and t. square or hex. nuts, blank or	S.A.E. U.S.S. S.A.E. U.S.S. 4in \$2.35 \$2.40	Milled standard set surews, case hardened 88-
tapped	A-in 0.515 0.515 %-in 8.60 8.60	Milled headless set serews, cut thread 38
	%-in 0.62 0.66 1-in 5.65 5.80	Upset hex. head cap screws, U. S. S. thread,
*F.o.b. Chicago and Pittsburgh. The discount on machine, carriage and lag	Te-in 0.79 0.90 11/6-in 8.90 8.90	Upset hex. cap screws, S. A. E. thread,
bolts is 5 per cent less than above for less than	%-in 1.81 1.05 1%-in 12.60 18.10 %-in 1.88 1.42 1%-in 18.85 18.85	Opset nex. cap screws, S. A. E. tarend,
car lots. On hot-pressed and cold-punched nuts the discount is 25c. less per 100 lb, than quoted	%-in 1.70 1.73 1%-in 21.00 21.00	Upset set screws80, 10 and 10 to 86, 10 and 25.
above for less than car lots.	Larger sizesPrices on application.	Milled stude
	1697	

Chicago

Heavy Car Buying-Pig Iron Shipments Exceed Record of 1920

CHICAGO, Dec. 15 .- Users' requirements in finished steel are heavier than during the month of November and mills report that demand for first quarter is insistent. The leading interest has increased operations slightly and is now producing at 87 per cent of ingot capacity. The foremost independent is still close to the 85 per cent mark. Steel works blast furnace opera-tions are the same, the active stacks being as follows: Steel Corporation, 17; Inland Steel Co., 3; Wisconsin Steel Co., 3, and the Youngstown Sheet & Tube Co., 2. Building activity is well maintained, and it is estimated that not less than 20,000 tons of structural material is about to be placed with local mills. The Texas Co. is in the market for 5000 tons of material for cracking Of 5000 freight cars placed during the week the bulk were for Eastern railroads and probably will be built in the East. The outstanding passenger equipment purchase was that of the New York Central which totaled 256 cars. Purchases of freight cars so far this year by that railroad total 9500, of which 8000 have been placed since Sept. 1.

Chicago mills, it is estimated, have participated to the extent of not less than 350,000 tons of steel in the freight car business placed thus far in 1925. fastenings are moving in good volume, the largest recent order being for 10,000 tons placed by the Chicago, Milwaukee & St. Paul.

Mills report that warehouses have purchased heavily of late. Jobbers' stocks, it is said, are normal, indicating that consumption has readily absorbed tonage passing through this channel. Makers of wire products find that the total volume of business booked so far this year exceeds that of 1924 by not less than December of this year is proving a much 15 per cent. better month from all standpoints than did the cor-responding period of last year.

Local merchant furnaces will go into 1926 with stocks approximately 60 per cent smaller than on Jan. Total sales of pig iron for the year will not equal those of 1920, but the present market is not speculative and sales are actually being shipped. This accounts for the fact that shipments this year will actually exceed those of 1920.

Ferroalloys.-Spiegeleisen has moved only in carload lots and several small tonnage sales of 50 per cent ferrosilicon are reported. Ferromanganese is quiet.

We quote 80 per cent ferromanganese, \$122.56, delivered; 50 per cent ferrosilicon, \$85, delivered; spiegeleisen, 18 to 22 per cent, \$41.76, delivered.

Coke.-Chicago district ovens are operating at full capacity, and shipments are in good volume. The ruling price on foundry coke is unchanged at \$10.50, ovens, or \$11, delivered in the Chicago switching district,

Fluorspar .- A large Chicago user is asking for prices to cover a year's requirements. Several local dealers state that current inquiries have been received from points east of Chicago where the freight rate is \$5.25, making the delivered price \$22.75, which is somewhat above the delivered quotation on foreign material, which is normally supplied to that district.

Pig Iron.—Chicago district furnace stocks are said to be fully 60 per cent below those of last January. The relatively quiet condition of the spot market is giving makers a breathing spell in which to balance stocks. Melters' stocks are said to have expanded slightly, bringing them more in line with the require-ments for the present rate of operations. It is only occasionally that a seller receives a request to defer delivery and the opinion throughout the trade is that shipments during this inventory and holiday period are moving more freely than has been the case for several years past. Prices of foundry grades are unchanged at \$23 for Northern No. 2, malleable and high phosphorus, and \$23.50 for Northern No. 1. A Milwaukee melter has bought 2500 tons of Northern iron. Charcoal iron, at \$29.04 delivered, is fairly active in carload lots. A few carloads of 8 per cent silvery have been taken for spot delivery at \$29.50, base furnace, or \$34.29, delivered. Several carlots of 14 to 16 per cent ferrosilicon are reported as having been sold within the range quoted below.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at con-sumers' yards.

2.4	THE THE PARTY OF T	
	Northern No. 2 foundry, sil. 1.75	
	to 2.25	\$23.00
	Northern No. 1 foundry, sil. 2.25	
	to 2.75	23.50
	Malleable, not over 2.25 sil	23.00
	High phosphorus	23.00
	Lake Superior charcoal, averag-	
	ing sil. 1.50, delivered at Chi-	
	cago	29.04
	Southern No. 2 (all rail)	27.01
	Southern No. 2 (barge and rail)	26.18
	Low phos., sil. 1 to 2 per cent.	
	copper free\$31.20 to	31.60
	Silvery, sil. 8 per cent	34.29
	Ferrosilicon, 14 to 16 per cent 45.25 to	45.75

Plates.-Chicago mills took a large share of the steel required for railroad cars placed during the Out of a total of approximately 55,000 cars ordered, over 35,000 were taken by Western shops, indicating that Western mills booked not less than 350,-000 tons of car material. Formal inquiry by the Pacific Fruit Express has not as yet been made, although current reports are to the effect that prices will be asked on 5000 refrigerator cars. New inquiries by Western railroads include freight cars for the Chicago & Eastern Illinois and both freight and passenger cars for the Missouri Pacific. Other railroads which are actively figuring on cars are the Rock Island, the St. Paul and the North Western. Railroads are calling for preliminary estimates on cars in connection with the preparation of budgets for 1926. Tank tonnage booked during the week was light.

The mill quotation is 2.10c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Bars.—Both in fresh orders and specifications soft steel bar business continues in unusual volume. Demand in the first two weeks of December has shown a substantial gain over the average for November. Mill prices remain firm at 2.10c., Chicago. Demand for rail steel bars is well maintained, largely, however, by the manufacturing trade as less of this product is required for concrete reinforcing at this season. Mill operations are unchanged and prices are steady at 2c. to 2.10c., Chicago. Makers of bar iron are encouraged by the volume of new business appearing and also by more liberal specifications. Bar iron is steady at 2c., Chi-Alloy steel bar mills report no change in the rate of their operations. Automobile builders are still specifying liberally, although it is said that they are not stocking, but are taking steel only in accord with their production schedules.

Mill prices are: Mild steel bars, 2.10c.; common ricon, 2c., Chicago; rail steel bars, 2c. to 2.10c.,

Chicago.

Jobbers quote 3c, for steel bars out of warehouse. The warehouse quotations on coid-rolled steel bars and shafting are 3.60c, for rounds and hexagons and 4.10c. for flats and squares; 4.15c. for hoops and 3.65c, for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c.

Rails and Track Supplies .- The Missouri Pacific has contracted for 16,000 tons of rails. The Illinois Steel Co., the Inland Steel Co., the Colorado Fuel & Iron Co., and the Tennessee Coal, Iron & Railroad Co. shared about equally in the distribution. Supplementing orders for 50,000 tons of rails, the St. Paul has placed 10,000 tons of fastenings, the major portion of them with local mills. A local maker has booked 6000 tons of rail joints. Orders for light rails were in small volume during the week. Steel tie plates are firm at 2.35c., f.o.b. Chicago district mills. This was the going price on 14,000 tons booked by one maker.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. maker's mill.
Standard railroad spikes, 2.90c. to 3c. mill; track bolts with square nuts, 3.90c. to 4c. mill; steel tie plates, 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill;

Jobbers quote standard spikes out of warehouse at 3.55c., base, and track bolts, 4.55c., base.

Wire Products.-In general, prices of wire products steadier than for some time past. Business is holding up better than usual for this season, the average for the first two weeks in December being considerably better than for the corresponding period last The total volume of business so far this year is said to be in excess of that of 1924 by not less than 15 per cent. Mill operations average 70 per cent, with nail production not better than 50 per cent and cold rolling departments, at the other extreme, running at 100 per cent. Greater interest is being shown in woven wire fencing for spring delivery. Due largely to the approaching inventory time both the manufacturing trade and jobbers are writing their specifications for delivery during the first two months of the coming Next week will see the usual practice adhered to of taking salesmen off the road until after the first of

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, \$3.30 per 100 lb.; common wire nails, \$3.05 per keg; cement-coated nails, \$2.05 to \$2.20 per count keg.

Sheets.-Chicago district mills find demand well sustained, with users specifying freely. There are indications that Chicago producers haven't enough capacity to supply the demand tributary to them, and that Eastern mills are taking business from sources where an even break can be had as to freight charges and base With a \$2 differential over Pittsburgh at Gary, the Eastern makers can come fairly well into the Gary territory without much freight absorption. It is probable that this practice is more common in tin plate than in sheets, although it is reported that some Western sheet business is going to Pittsburgh district mills.

Chicago delivered prices from mill, 3.50c, for No. 28 black, 2.65c, for No. 10 blue annealed and 4.75c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c, per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago; 3.50c. base for blue annealed, 4.10c. base for black, and 5.25c. base for galvanized.

Structural Material.--Demand for structural shapes is well maintained and the Chicago mill price is firm With fabricating shops well booked, less is at 2.10c. heard of sharp bidding; in fact, fabricators' prices are said to be more stable now than at any time within the past six or eight months. The outstanding award of the week was that of the Adams Street bridge for The outstanding award the city of Chicago, which called for 1425 tons. Chicago high schools, calling for 2700 tons were also contracted for. The total tonnage of new inquiries is not so great as during the previous week, as new business consists mainly of small jobs.

The mill quotation on plain material is 2.10c.. Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Cast Iron Pipe.-Outside of the large Detroit tonnage, which was divided between American and European shops, lettings are small and new business, most instances, will not come up for bids until after Jan. 1. There now seems to be little prospect for concessions on pipe for winter manufacture, unless the Detroit tonnage may be classed as such. The Bloomington, Ind., inquiry for 450 tons has been postponed.

It is notheworthy that of the recent 17,000 tons of pipe awarded by Detroit, De Lavaud centrifugal pipe, 6 and 8-in., equivalent to 9000 tons of sand cast, was placed with the United States Cast Iron Pipe & Foundry Co. B. Nicoll & Co., representing the Pont-a-Mousson works took 4000 tons of 6-in. and 2000 tons of 12-in. and the Lynchburg Foundry Co. took 2000 tons of 12-in.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$54.20; 6-in. and over, \$50.20; Class A and gas pipe, \$4 extra.

Reinforcing Bars .- With mild weather still prevailing, contractors continue to bring in a liberal number of new projects for figures, and at the same time lettings, although small, are fairly numerous. Thus far in December both awards and fresh inquiries have been heavier than was anticipated. A number of large tonnage projects are still active, among them two Chicago high schools, each requiring about 600 tons. An indication of a spring revival in reinforcing bar buying is seen in the fact that both architects and engineers

are now crowded with work. Warehouse stocks of bars are being allowed to run a little lower as the inventory period approaches. Billet steel reinforcing bars are still quoted at 2.60c., Chicago warehouse. Recent lettings and new pending work are shown on page 1708.

Bolts, Nuts and Rivets.-Contracts for the first quarter are now being signed and prices are unchanged. Demand is well sustained and plant operations are unchanged. Although reports were abroad that the price of stove bolts would be advanced for first quarter, contracts are being signed at the former quotation of 80, 10, 5 and 21/2 off list in bulk.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to % x 4 in., 50 and 5 per cent off; larger sizes, 50 and 5 off; carriage bolts up to % x 4 in., 47½ off; larger sizes, 47½ off; hot-pressed nuts, square, tapped or blank, \$3.25 off; hot-pressed nuts, hexagon, tapped or blank, \$3.25 off; coach or lag screws, 55 and 5 per cent off.

Hot-Rolled Strip .- Users are still specifying freely and prices are unchanged at 2.60c., base Chicago, for and narrower, and 2.50c., base Chicago, for wider than 6 in.

Sheet Bars.-Makers report a good tonnage placed for first quarter delivery at \$36 per gross ton, Chicago.

Old Material.—The supply of scrap is still greater than the demand and many grades have weakened during the week. New buying by users has largely disappeared from the market, transactions being confined almost wholly to trading among dealers who are filling obligations against previous contracts. Short turnings are probably the most active specialty, this being due to the fact that many users have a standing order for this commodity. The top of the heavy melting steel market is \$15.75, with the principal user well supplied and deferring shipments from time to time. A tonnage of rails for rerolling was purchased early in the week by a dealer at \$18.75 and sold direct for \$19. A small tonnage of No. 1 wrought was purchased from a dealer at \$13.75. Railroad tonnage appearing on track and the anxiety of some dealers to rush out scrap ahead of bad weather, accounts in a large measure for the present glutted market. Railroad lists include those of the Rock Island for 4300 tons and the Chesapeake & Ohio, 4500 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

Per Gross Ton		
Cast iron car wheels Relaying rails, 56 lb. to 60 lb. Relaying rails, 65 lb. and heavier Forged steel car wheels Railroad tires, charging box size Railroad leaf springs, cut apart. Rails for rolling. Steel rails, less than 3 ft. Heavy meiting steel. Frogs, switches and guards, cut apart Shoveling steel Drop forge flashings Hydraulic compressed sheets.	18.50 to 25.00 to 26.00 to 19.00 to 19.00 to 19.25 to 18.50 to 19.00 to 15.50 to 17.25 to 15.25 to 13.75 to 13.75 to	19.00 26.00 31.00 19.50 19.50 19.50 19.50 15.75 17.75 15.50 12.50 14.25
Axle turnings Steel angle bars Steel knuckles and couplers Coil springs Low phos. punchings Machine shop turnings Cast borings Short shoveling turnings Railroad malleable Agricultural malleable	15.00 to 18.50 to 18.00 to 19.00 to 17.50 to 13.50 to 13.25 to 18.25 to 16.50 to	15.50 19.00 18.50 19.50 18.00 10.00 13.75 13.75 18.75 17.00
Per Net Ton		
Iron angle and splice bars. Iron arch bars and transoms. Iron car axles Steel car axles No. 1 busheling No. 2 busheling Pipes and flues No. 1 railroad wrought No. 2 railroad wrought No. 1 machinery cast No. 1 railroad cast No. 1 agricultural cast	16.50 to 21.00 to 26.00 to 18.00 to 12.50 to 9.25 to 11.00 to 13.75 to 13.75 to 17.00 to 16.00 to	17.00 21.50 26.50 18.50 13.00 9.75 11.80 14.25 14.00 17.50 16.50
Locomotive tires, smooth Stove plate Grate bars Brake shoes	16.50 to 14.75 to 14.00 to 13.50 to	17.00 18.25 14.50 14.00

Boston

New England Ovens Meet Foreign Competition—Heavy Gas Pipe Inquiry

Boston, Dec. 15.—One 1000-ton lot of Northern No. 2X and No. 1X, mixed, for first quarter delivery was the outstanding sale in this market the past week. Otherwise current and prospective business is still confined to small tonnages of more or less special analysis for mixing purposes. With the exception of one Buffalo furnace, which has advanced its first quarter prices 50c. a ton to \$21.50, base furnace, producers are naming unchanged quotations. A third Susquehanna furnace is about to blow in because of the sold up condition of the stacks now active. The top quotation on Buffalo iron is \$22, base furnace; western Pennsylvania iron is generally bringing \$22.50, base furnace, except when the freight rate into New England exceeds that from Buffalo, in which case about \$1 a ton less is asked. New York State iron is around \$22, base furnace. Quotations on eastern Pennsylvania, Virginia and Alabama irons are largely nominal because of the scarcity of offerings. German iron prices appear weak at around \$22, on dock duty paid, but quotations on other foreign irons are practically the same as a week ago.

We quote delivered prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

Pig Iron Imports.—Local imports of pig iron for November consisted of 1060 tons shipped from India, 4146 tons from Holland, 1247 tons from Belgium and 684 tons from Germany, a total of 7137 tons, which compares with a total of 6264 tons for October. The aggregate imports for the year to Nov. 30 were 86,856 tons, including 52,006 tons shipped from India, 23,288 tons from Holland, 4853 tons from Belgium, 5459 tons from Germany, 750 tons from England and 500 tons from Scotland.

Shapes and Plates.—The past week was one of the quietest experienced by fabricators in months. There were no lettings calling for 100 tons of steel or more. The Home for Agcd Women, Boston, 256 tons, will be refigured. The Morton C. Tuttle Co., Boston, has been awarded a contract for a plant addition for the West Virginia Pulp & Paper Co., Williamsburg, Pa. The paper company will buy its steel direct. The market on shapes is unchanged at 1.90c. to 2c., base Pittsburgh, or 2.265c. to 2.365c. per lb., delivered. Buying of plates is receding with prices maintained at 1.965c. per lb., delivered, to 2.165c. Bars remain at 2.365c. and 2.465c. per lb., delivered, or 2c. and 2.10c., base Pittsburgh.

Cast Iron Pipe.—A domestic foundry was the low bidder for 800 tons of 6-in. to 16-in. pipe required by New Haven, Conn. The contract has not been officially awarded. Attleboro, Mass, has placed about 100 tons of 6-in. pipe with the Warren Foundry & Pipe Co. Private lettings continue in good volume and prices on pipe are very steady. Municipalities are still feeling out the market for early spring requirements. All of the utility companies not already covered for spring, appear to have come into the market at once. Probably 30,000 tons of gas pipe are pending. Prices quoted on domestic pipe follow: 4-in., \$60.10 per ton, delivered, common Boston freight rate points; 6-in. to 16-in., \$56.10; 20-in. and larger, \$55.10. The usual differential of \$5 a ton is asked on gas pipe.

Coke.—Aside from the fact that consumption is less active, the by-product foundry coke situation is unchanged. The New England Coal & Coke Co. and the Providence Gas Co. still quote \$13 a ton, delivered within a \$3.10 freight rate zone. Connellsville ovens are actively soliciting business in New England at \$5.50, on cars ovens, or \$11.05, delivered. With one or two exceptions in each State, foundries in Maine, New

Hampshire and Vermont are quiet. In Massachusetts some recession in activity is noted at Springfield. A Worcester malleable foundry is operating at between 60 per cent and 70 per cent of capacity, while gray iron plants are doing little. Local and nearby foundries are moderately busy, yet the weekly melt is less than a month ago. A Providence, R. I., machine tool foundry is active, but work at other foundries in that city is diminishing, and some letdown is noted in Connecticut. Considerable price cutting on castings is going on, indicating that certain foundries are hard pressed to keep going.

Activity in coke centers in domestic fuel. Competition from imported coke is keen, but in view of the fact that New England ovens have begun to meet prices quoted on foreign fuel, the peak in the importation movement is believed not distant. Within the past few days 7466 tons of Scotch coke has arrived, bringing importations within the past month or so up to around 21,000 tons. An unconfirmed report has it that importations probably will reach 100,000 tons. This estimate, however, was made before domestic ovens began meeting imported coke prices. In addition to coke, sizable tonnages of Welsh, Scotch and English anthracite coal have been received at this port and large tonnages are on their way, at prices which are less than those quoted on domestic anthracite.

Old Material.—Old material, in general, is in light demand and prices for some items are easier. Current buying of heavy melting steel and pipe is confined to occasional car lots, but offerings are limited and consequently prices are holding well. The market for turnings and borings and for such material as skeleton and forged scrap is 25c. to 50c. a ton lower, inasmuch as some holders are endeavoring to force sales. New England mills have sufficient material to carry them well into the first quarter; hence they are not expected to buy until January. New England foundries continue to supply their machinery cast wants from local or nearby yards, which limits operations in the Boston market.

The following prices are for gross ton lots delivered consuming points:

Textile cast\$20.00 to \$20.50

No. 2 machinery cast	0
The following prices are offered per gross tots f.o.b. Boston rate shipping points:	to
No. 1 heavy melting steel	50 0000 5000 500 500 500 500 500 500 50

Birmingham

Output Remains Heavy But Buying Suffers Year-End Lull

BIRMINGHAM, Dec. 15.—While furnaces do not expect a steady sale of pig iron until the end of the year small-lot orders continue to come in and shipments are heavy. The holiday spirit has had little effect on plant activity; on the contrary, both production and deliveries are being pushed. Very few plants in this territory will suspend operations for a full week over the holidays. Cast iron pressure pipe plants will stop work Wednesday evening, Dec. 23, and lay idle for three days, resuming the following Monday. There will be one or two days' suspension of activity at coal and ore mines. The only plants which will continue to operate without interruption will be the blast furnaces and byproduct coke ovens. Surplus iron on furnace banks is being steadily reduced and will probably be wiped out

by the close of the month. Indication of fresh needs for iron in the Middle West are seen in inquiries of from 500 tons up, calling for delivery during first quarter. No second quarter sales have been consumated. Foundry iron still ranges from \$22 to \$23,

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

plants operating practically at capacity, the satisfac-tory aspect of the business situation has been given emphasis by the announcement of plans for large additions to the Fairfield works of the Tennessee, Coal, Iron & Railroad Co. (Details are given elsewhere.) ous forms of finished steel are in strong demand. Mills apparently are making an effort to make up the loss of time which will be incurred by reason of the holidays. Plates and shapes are quoted at 2.05c. to 2.15c., base Birmingham, and soft steel bars at 2.15c. to 2.25c.

Cast Iron Pipe.-Pressure pipe shops accumulated little tonnage on yards, as shipments are being made as rapidly as pipe is produced. New business is good, particularly in the Southeast and Southwest, where pipe can be laid the year round. Early spring business promises to come up to expectations and preparations are being made to expand output accordingly.

Coke.—Sales already made warrant a continuation of full operations at coke plants. Quotations are strong at \$5.75 to \$6, Birmingham, with a premium of 50c. being asked on spot business. The fact that the Tennessee Coal, Iron & Railroad Co. will add 77 ovens to present large coke plant at Fairfield, is not a disturbing element in the market, inasmuch as the company will need all of the coke produced when the additional capacity is completed. The shipment of coke to outside territories promises to continue for some

Old Material.—Shipments are moving in quantity from dealers to consumers. Dealers are purchasing considerable old material, but new consumer buying is not very extensive. The melt of old material is large with no signs of diminishing in the near future.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical\$15.00 to \$16.00
Heavy melting steel 14.00 to 14.50
Railroad wrought 13.00 to 13.50
Steel axles 19.00 to 20.00
Iron axles 18.00 to 19.00
Steel rails 14.00 to 14.50
No. 1 cast
Tramcar wheels 17.00 to 17.50
Car wheels 16.00 to 16.50
Stove plate 14.00 to 14.50
Machine shop turnings 8.00 to 8.50
Cast iron borings 8.00 to 8.50
Rails for rolling 17.50 to 18.00

Buffalo

Inquiry for 2000 Tons of Pig Iron in Quiet Market

BUFFALO, Dec. 15 .- Makers of basic pig iron are interested this week in an inquiry for 2000 tons re-cently put out. This lot is the largest sought in a dull market. Prices seem firm, but pending business has declined to about 4000 tons in the aggregate. Not much iron is left for disposal in this quarter and interest centers in sales for first quarter. One furnace is quoting \$22 and is not anxious to sell much; another quotes \$21.50, an advance of 50c. from its last week's price of \$21; while a third producer which had been asking \$22 for first quarter, found it had acted somewhat precipitately and has dropped back to \$21. Only one furnace is quoting as low as \$21 for last quarter. On basic \$20.50 is being named.

Finished Iron and Steel .--Mills are running at between 85 to 90 per cent with apparently a couple of months of good operations ahead. Sheet mills are busy, with sellers naming 2.50c., base Pittsburgh, on blue annealed; 3.30c. to 3.40c. on black, 4.60c. on galvanized, and 4.50c. on full finished. Wire business is good, with mill operations around 80 per cent. Bar business is satisfactory and plate business is improving. The city of Buffalo will build an incinerator for garbage which will require 220 tons of reinforcing bars. Demand for bars for road building has fallen off with the season, but at least one contractor is experimenting with a steam-heating plant to enable him to lay concrete all Warehouse demand has held up well with . winter. business particularly good in galvanized sheets.

Warehouse prices are being quoted as follows: Steel bars, 3.30c.; steel shapes, 3.40c.; steel plates, 3.40c.; No. 10 blue annealed sheets, 8.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized, 5.75c.; cold-rolled shapes, 4.45c.; cold-rolled rounds, 3.95c.; wire nails, 3.90c.; black wire, 3.90c.

Old Material.—One mill continues to purchase heavy melting steel at \$18 though it is not likely that a ton-nage of strictly No. 1 grade could be had at that price. Another consumer that purchased 2000 tons of heavy melting steel two weeks ago, has bought approximately 500 tons additional. Mills throughout the district are very busy and scrap dealers predict another buying movement by the first of the year though the present week is rendered dull by inventory-taking and other end-of-the-year routine. Buying in outside districts is not very active, though some mixed borings and turnings are going at \$13.50. Tonawanda has purchased cast iron borings and short turnings for blast furnace use at \$14. Machine shop turnings and cast iron borings are commanding \$13 to \$13.50 Buffalo. Specialties are quiet, with an occasional sale of low phosphorus.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel\$18.50 to	\$19.50
Low phosphorus 20.00 to	21.00
No. 1 railroad wrought 16.50 to	17.00
Car wheels 17.50 to	18.00
Machine shop turnings 13.00 to	13.50
Mixed borings and turnings 13.50 to	14.00
Cast iron borings 13.00 to	13.50
No. 1 busheling 16.50 to	0 17.50
Stove plate	15.00
Grate bars 14.50 to	0 15.00
Hand bundled sheets 13.00 to	0 13.50
Hydraulic compressed 16.50 to	0 17.50
No. 1 machinery cast 17.50 to	0 18.00
Railroad malleable 20.00 t	0 21.00
No. 1 cast scrap 17.50 t	0 18.00
Iron axles 26.00 t	0 27.00
Steel axles 20.00 t	0 21.00

St. Louis

Pig Iron, Steel and Scrap Quiet as Inventories Approach

St. Louis, Dec. 15 .- The pig iron market is exceedingly quiet, probably because of the approach of the holiday period. While there was very little buying during the week and no sizable inquiries were issued, melters have been pressing for shipments against contracts and operations in the district are virtually at full capacity. The Granite City furnace is committed until May 1. The market is firm at unchanged prices.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$4.42 from Birmingham, all rail, and \$1c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25... Northern malleable, sil. 1.75 to 2.25 \$25.66 Basic Southern fdy., sil. 1.75 to 2.25. \$25.42 to 26.42 Granite City iron, sil. 1.75 to 2.25. 24.31 to 24.81

Coke.-There is a good demand for foundry coke, with most current business going to by-product ovens. Shipments of domestic grades are heavy, although warmer weather is having some effect on new buying. Eastern markets are looking to this district for considerable tonnage on account of the anthracite shortage, and some sales are being made for Canadian con-

Finished Iron and Steel.-Inventories and the ap proach of the holiday season have had the effect of slowing down business in finished iron and steel lines, and a revival of activity is not looked for until after Jan. 1. The only structural job of any size pending, the McCrory Store building, 770 tons, went to the Mississippi Valley Structural Steel Co. Demand for reinforcing bars is light.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.25c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, cold rolled, one pass, 4.60c.; galvanized sheets, No. 28, 5.70c.; black corrugated sheets, 4.65c.; galvanized, 5.75c.; cold-rolled rounds, shafting and screw stock, 3.75c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, 7 in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 and 5 per cent; lag screws, 55½ per cent; hot-pressed nuts, square, \$3.25; hexagon, blank or tapped, \$3.75 off list.

Old Material.—Consumers not only refuse to buy anything, but they are asking dealers to withhold shipments of materials already contracted for, in their desire to keep down inventories of raw material. On the other hand, railroads are eager to reduce their stocks of old material before inventories, and are flooding the market with lists. The result is weakness in prices, nearly every item on the list being 25 to 50 cents a ton lower than a week ago. Railroad lists include: Missouri Pacific, 1500 tons; Texas & Pacific, 1600 tons; Missouri-Kansas-Texas, 1400 tons; Wabash, 3400 tons; Chesapeake & Ohio, 2500 tons; Northern Pacific, 7500 tons; Southern Pacific, 1500 tons; Rock Island, 4300 tons, and Southern, 7600 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as

Cincinnati

Scrap Declines—Good Demand for By-Product Foundry Coke

CINCINNATI, Dec. 15.—The pig iron market is sluggish and sales in the past week totaled only 4000 tons. With Alabama furnaces making little effort to secure business in this territory and with one Ironton producer temporarily out of the market, competition has been narrowed. Foundry iron in the Ironton district continues to sell at \$21, base Ironton, and Tennessee iron is quoted at \$21, base Birmingham. Producers in Alabama are asking \$22, base Birmingham, a price which is so high that it virtually eliminates them from the local market. Movement of silvery iron is confined to small lots, but quotations are firm. The Muncie Malleable Iron Co., Muncie, Ind., has closed for 1500 tons of malleable iron, while it is reported that Henry Vogt, Louisville, has taken 500 tons of foundry iron. A local broker sold 100 tons of ferromanganese to an Indiana consumer. Little improvement in sales is anticipated until about the second week in January.

Based on freight rates of \$3.69 from Birmingham and \$2.27 from Ironton, we quote f.o.b. Cincinnati;

ind \$2.21 from fronton, we quote 1.0.0. Ci	ucumati
Alabama fdy., sil. 1.75 to 2.25	
(base)	\$25.69
Alabama fdy., sil. 2.25 to 2.75	26.19
Tennessee fdy., sil. 1.75 to 2.25	24.69
Southern Ohio silvery, 8 per cent	31.77
Southern Ohio fdv., sil, 1.75 to	
2.25\$23.27 to	23.77
South'n Ohio, malleable (nominal)	23.27

Reinforcing Bars.—With architects asking for bids on several important projects, the market is taking on more life. No change has been made in prices, new billet bars selling at 2c., Cleveland, and rail steel bars at 1.90c., mill.

Warehouse Business.—While business cannot be called brisk, the volume of sales is holding up remarkably well for the middle of December. The recession in demand for structural material has been offset by increased business in galvanized and blue annealed sheets and bars. Jobbers of cold-rolled products report liberal buying by local machine tool manufacturers. Prices are steady and unchanged.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4c. to 4.25c.; bands, 3.95c.; shapes, 3.40c.: plates, 3.40c.; cold-rolled rounds and hexagons, 3.85c.; squares, 4.35c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 liue annealed sheets, 3.60c.; No. 28 black sheets, 4.10c. to 4.30c.; No. 28 galvanized sheets, 5.25c. to 5.40c.; No. 9 annealed wire, \$3 per 100 lb.; common wire nails, \$2.95 per keg base; cement coated nails, \$2.25 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list. Boiler tubes: prices net per 100 ft. lap-welded steel tubes, 2-in., \$18; 4-in., \$38; seamless, 2-in., \$19; 4-in., \$39.

Finished Material.-A steady flow of first quarter business has enabled sellers to maintain sales about on the level with those in the first half of November. Specifications against contracts are liberal, and the fact that orders are coming from diverse sources indicates a healthy market condition. Buyers generally are placing tonnages for January delivery, thereby seeking to reduce their stock to a minimum during the inventory period at the end of this month. The movement of bars is moderate, and prices are showing stability at 2c. to 2.10c., Pittsburgh. It is seldom, however, that sales are made at the latter figure, as consumers are well protected in most cases at 2c. While plates are quoted at 2c., Pittsburgh, inviting tonnages will bring out a price of 1.90c. Shapes are in fair demand at 2c. to 2.10c., Pittsburgh. Sellers admit that they cannot obtain more than 2c., although several of them are consistently quoting 2.10c. There is a slightly improved market for black sheets, which remain at 3.35c., Pittsburgh. Blue annealed sheets have strength-ened and are selling at 2.50c., Pittsburgh. Demand for galvanized sheets is less pronounced, but quotations remain firm at 4.60c., Pittsburgh. The Louisville & Nashville Railroad is inquiring for 700 tons of plates and sheets. Sheet mill operations continue at 87 per cent of capacity. In wire goods interest has been aroused by the excellent demand for fencing for the spring trade. Shipments of both nails and wire by Prices are firm, with common wire river are heavy. nails quoted at \$2.65 per keg, Pittsburgh or Ironton, and plain wire at \$2.50 per 100 lb., Pittsburgh or Ironton. The structural market has been given impetus by the appearance of several sizable jobs which will be awarded soon. Gas holder fabricators are figuring on attractive inquiries.

Coke,—The lessened demand for domestic coke is offset by the large volume of by-product foundry coke being shipped to Ohio and Indiana consumers. While nearby by-product coke companies are selling domestic grades at \$8.64, delivered Cincinnati, producers in the Birmingham district are offering similar grades at \$8.38, delivered. Little interest is manifested in furnace coke. There is considerable movement of by-product coke into Michigan from Alabama. The market for Wise County and New River beehive coke is quiet. Operations of by-product coke companies in this territory are being sustained at capacity.

Based on freight rates of \$2.14 from Ashland, Ky., \$3.53 from Connellsville, \$2.90 from New River ovens and \$2.59 from Wise County ovens, we quote f.o.b. Cincinnati: Connellsville foundry, \$9.03 to \$11.03; Wise County foundry, \$8.09 to \$9.59; New River foundry, \$9.90 to \$11.40; by-product foundry, \$10.64.

Old Material.—The lack of consumer interest has necessitated a reduction of 50c. on most items, including heavy melting steel. Railroad offerings the past week brought out lower bids than prevailed last month.

Cast iron grades are showing strength because of an increase in demand from foundries.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton		
Heavy melting steel	15.00 15.00 19.00 28.00 16.00 14.50 17.50 16.50 16.00 10.00 12.00	
Per Net Ton		
Cast iron borings 9.50 to Machine shop turnings 8.00 to No. 1 machinery cast 20.00 to No. 1 railroad cast 16.00 to Iron axles 23.00 to No. 1 railroad wrought 12.00 to Pipes and flues 9.50 to No. 1 busheling 11.00 to Mixed busheling 9.50 to Burnt cast 10.00 to	12.50 10.00 11.50 10.00	
Stove plate	99 60	

New York

Sales of 15,000 Tons of Pig Iron— Seasonal Quiet in Steel

New York, Dec. 15.—Sales in this district last week were surprisingly large for the season, aggregating 15,000 tons. Of that total nearly 11,000 tons was sold by one broker. Most of the tonnage was domestic iron for first quarter delivery and no individual sale exceeded 2000 tons. A quiet market is looked for until inventories have been completed early in January. Meanwhile melters are not anxious to accumulate stocks and, in some instances, have held up shipments. Prices show little change. Continental foundry iron has been sold at \$22 to \$22.50, duty paid port of entry, but occasional distress lots have been sacrificed at concessions. The Port Henry, N. Y., furnace has not yet got into blast. Four other Eastern furnaces contemplate going in late this year or early in 1926. This increase in production, together with the continued importation of foreign iron, will be watched for its effect on the price situation.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.54 from Virginia:

5.54 Hom virginia :		
East. Pa. No. 2, sil. 1.75 to 2.25	8:	25.52
East. Pa. No. 2X fdy., sil. 2.25		
to 2.75\$25.52	to :	26.02
East. Pa. No. 1X fdy., sll. 2.75 to 3.25	40	00 50
Buffalo, sil. 1.75 to 2.25 25.91		
No. 2 Virginia, sil. 1.75 to 2.25		29.54

Warehouse Business.—Despite the general quiet throughout the market, prices are holding quite firmly, and in the case of galvanized sheets, there is a slight upward tendency, the 5.35c. per lb. base price prevailing largely on the more sizable lots and 5.50c. per lb. becoming more common. Black sheets, however, are still quotable at 5.35c. per lb. to 5.50c. per lb., base, with only the small lot purchases taking the higher price as a rule. The non-ferrous metals are quiet and slight decreases in price are noted in some instances. Prices on page 1726. We quote boiler tubes per 100 ft. as follows:

Lap welded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

Ferroalloys.—Some surprise is expressed that contracts for ferromanganese for 1926 consumption are apparently so few. One explanation is that most consumers are holding off until after the holidays before making commitments. Another is that possibly some fairly heavy contracting is being done quietly without any formal bids. So far as sales of the British and domestic alloy are concerned, the week has witnessed very few contracts, possibly 200 to 300 tons made up

of carload and 50-ton lots, most of it for early shipment. Prices remain unchanged and firm. Because of the heavy buying of spiegeleisen in the past month, very little new business is reported, most consumers being fairly well covered for the early part of next year.

Finished Iron and Steel .- A year-end lull in specifying of steel on contracts has given the steel market an appearance of dullness as compared with the activity of the past two months. Some mills are having difficulty in getting their customers to specify their December quotas, and the assumption is that heavier specifications will be received in the last week of the month so that the steel will come to them in January. There is also less activity in structural steel lettings, which have been one of the chief sources of heavy tonnage during the fall. In structural steel, however, this is somewhat between seasons, and a resumption of contracting for building construction on a large scale early in the year is indicated by the inquiries that are pending or scheduled for issuance soon. The largest business of the week was the placing of substantial orders for track material by the New York Central The inquiry called for 3,000,000 tie plates, but Lines. more than this number is believed to have been distributed, several mills getting fairly large orders. The New York Central also ordered track bolts, angle bars and spikes. Wire nails again show slight weakness, at least one large producer and two or three jobbers having made sales on the basis of \$2.60 per keg, Pitts-The sheet market is a little upset because of offerings by sales representatives of one Pittsburgh district mill at \$2 a ton under the prices quoted by other mills. First quarter contracts for galvanized sheets at 4.50c., Pittsburgh, have been sent to some buyers. Eastern plate mills are making few sales at 1.80c., Pittsburgh, the new price recently announced. For prompt specification in lots of desirable size, plates are still obtainable at 1.70c., Pittsburgh, though the mills are firm in their declarations that 1.80c. is minimum for first quarter. Structural shapes range from 1.90c. to 2c., with few concessions, and steel bars are holding at 2c., Pittsburgh. Railroad car buying has shown signs of improvement.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. to 2.44c.; plates, 2.04c. to 2.14c.; structural shapes, 2.24c. to 2.34c.; bar iron, 2.24c.

Cast Iron Pipe.—Despite the seasonal quiet in water pipe, there is still considerable activity in purchasing of gas pipe and makers are so well booked with business that the usual \$1 and \$2 per ton concessions for winter delivery are not yet in evidence. The Consolidated Gas Co., New York, is understood to have purchased 6000 to 8000 tons of gas pipe from the leading maker. Opening of second bids by Providence, R. I., on 1000 tons of 6 to 16-in. water pipe brought out a low bid by William H. Muller & Co., New York, quoting on Gelsenkirchener Bergwerks pipe. Award has not yet been made. A gas company in Rhode Island has closed on 3600 tons of gas pipe was that of the American Construction & Securities Co., understood to have closed on about 25,000 tons.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$50.60 to \$52.60; 4-in. and 5-in., \$55.60 and \$57.60; 3-in., \$65.60 to \$67.60, with \$5 additional for Class A and gas pipe. Discounts both of Northern and of Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 42½ to 43¼ per cent off list; heavy, 52½ to 53¼ per cent off list;

Coke.—The market is firm with foundry coke quoted at \$5.25 to \$6.25 per ton, and domestic sizes at \$6.50 to \$7 per ton for stove and egg and \$7.25 to \$7.50 per ton for nut. By-product is unchanged at \$11.52 per ton, delivered Newark or Jersey City, N. J.

Old Material.—With new buying by consumers of scrap at a low ebb as the year draws to a close, the market is quiet but fairly firm on most grades. Brokers buying prices on heavy melting steel range from \$16.75 per ton to as high as \$17.50 per ton, delivered eastern Pennsylvania. Turnings, bundled skeleton and stove

plate are still being purchased at \$15 per ton, delivered eastern Pennsylvania. Foundry consumers of stove plate at West Mahwah, N. J., and Bridgeport, Conn., are not in the market at present but smaller local users in this district are reported purchasing at desirable prices.

Buying prices per gross ton New	York fo	llow:
Heavy melting steel (yard)	11.75 to 5	12.25
Heavy melting steel (railroad or	, , , , , , , , , , , , , , , , , , , ,	20.20
equivalent)	13.50 to	14.00
Rails for rolling	14.50 to	15.00
Relaying rails, nominal	23.00 to	24.00
Steel car axles	22.00 to	22.50
Iron car axles	24.50 to	25.00
No. 1 railroad wrought	14.50 to	15.00
Forge fire	11.00 to	11.50
No. 1 yard wrought, long	14.00 to	14.50
Cast borings (steel mill)	10.25 to	11.25
Cast borings (chemical)		
Machine shop turnings	11.00 to	11.50
Mixed borings and turnings	10.75 to	11.25
Iron and steel pipe (1 in. diam.,	10.10 00	22.00
not under 2 ft. long)	12.75 to	13.25
Stove plate (steel mill)	10.75 to	
Stove plate (foundry)	12.00 to	12.25
Locomotive grate bars		
Malleable cast (railroad)	16 50 to	
Cast iron car wheels		
No. 1 heavy breakable cast	14 00 to	15.00
Prices which dealers in New Yo	rk and b	srooklyn
are quoting to local foundries per	gross ton	TOHOW:
No. 1 machinery cast	\$18.50 to	\$19.00
No. 1 heavy cast (columns, build-		
ing material, etc.), cupola size	17.00 to	17.50
No. 2 cast (radiators, cast boil-		
ers. etc.)	16.00 to	16.50

Cleveland

Nickel Plate Places 20,000 Tons of Rails— Otis Blows In Furnace

CLEVELAND, Dec. 15 .- Most consumers of finished steel are covered with first quarter contracts or with orders covering their January requirements. Consequently the market has grown somewhat less active, although a fair volume of new business is still coming out. Automobile manufacturers continue to place steel for early requirements or for the first quarter, but are buying rather cautiously. While automobile companies are planning good production during the first quarter, reports indicate that they do not expect to maintain as high a production rate during that period as they did in the present quarter. Some suspensions of December shipments have come from this industry and from other consumers because of inventories. The from other consumers because of inventories. deadlock between the automobile manufacturers and makers of forgings and other parts continues, but a number of the parts makers have closed first quarter contracts for steel and one has covered for the entire first half. While deliveries have become more extended, steel bars in small sizes can still be placed for December shipment. Steel bars are firm at 2c., Pittsburgh. The plate market shows further signs of strength and, 1.85c. is the more while 1.80c. has not disappeared, common minimum price and considerable business in first quarter contracts has been taken at 1.90c. Structural material is commonly quoted at 2c., although a round lot might still bring out 1.90c. Structural inquiry is light.

Jobbers quote steel bars, \$.10c.; plates and structural shapes, \$.20c.; No. 28 black sheets, 3.95c.; No. 28 galvanized sheets, 5.10c.; No. 10 blue annealed sheets, \$.15c.; cold-rolled rounds and hexagons, \$.90c.; flats and squares, 4.40c.; hoops and bands, \$.85c.; No. 9 annealed wire, \$3 per 100 ib.; No. 9 galvanized wire, \$3.45 per 100 lb.; common wire nails, \$3 base per 100 lb.

Pig Iron.—The United Alloy Steel Corporation, Canton, Ohio, has purchased 10,000 tons of basic iron from a Valley producer for first quarter delivery, at \$20, furnace. The trade regards this as an indication of continued heavy demand for steel from the automotive industry, because the Canton company's output goes largely into the manufacture of automobiles, and it makes about all the iron it needs, unless its steel plant is running close to capacity. The Canton purchase was the outstanding one in a dull week, although one Lake furnace interest reports some increase in orders and inquiries over the previous week. This producer sold 4000 tons of foundry and malleable iron, including 500-ton lots to two or three foundries that had pre-

viously covered for only part of their requirements, having withheld orders for a possible weakening in prices. Shipments continue good, although the approaching inventory period has caused some holding up of orders. However, some of the automobile foundries that have stopped deliveries have issued shipping orders for January which are sufficiently large to include the iron held up this month, in addition to their regular monthly quotas. Some foundries are already ordering iron against first quarter contracts. Activity in this immediate territory during the week was confined to sales in lots of around 100 tons. The market shows no signs of weakness, with no variation from \$20.50, Valley, and the \$23, Lake furnace, which have prevailed as ruling market prices for several weeks. Several carlot sales of low phosphorus iron were made at \$28.50. The Otis Steel Co. has blown in its second Cleveland furnace, which has been out for relining, and the McKinney Steel Co. expects to start up within a week its fourth stack, which has been rebuilt. Both these producers have been out of the market for some time and, with large outstanding commitments, neither has opened its books for additional business.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6.01 from Birmingham.

Basic, Valley furnace	\$20.00
N'th'n No 2 fdv sil 1 75 to 2.25.	22.26
Southern fdy., sil. 1.75 to 2.25\$27.01 to	28.01
Malleable	22.26
Ohio silvery, 8 per cent	32.52
Standard low phos., Valley fur-	
28.00 to	28 50

Iron Ore.—The consumption of Lake Superior ore during the year, from May 1, 1925, to May 1, 1926, will be a little less than the amount shipped during 1925 and, consequently, the stocks on docks and furnace yards May 1, next year, will be slightly larger than on the same date a year ago. This statement is based on ore shipments for this year, on the amount consumed up to Dec. 1 and on the estimated consumption to May 1, next year. The total season's shipment, including the estimated all rail shipments, will be approximately 55,550,000 tons. The total amount of ore in furnace yards and on docks on May 1, last year, was 17,311,822 tons. Deducting the 1,357,000 tons shipped in April and the 315,000 tons at Canadian furnaces, the amount carried over from 1924 was 15,639,822 tons. Figures showing furnace and dock stocks on May 1 indicate a tendency among consumers to carry less ore in reserve than formerly. This is probably due to better transportation and handling facilities and to the fact that consumers regard serious labor troubles at the mines less probable than a few years ago.

Bolts, Nuts and Rivets.—Specifications for bolts, nuts and rivets are holding up well, but are not so heavy as they have been because of the approach of inventories. Consumers are contracting quite freely for the first quarter. The leading local rivet manufacturer expects to open its books this week for large rivets for the first quarter. The present price will probably be re-established.

Rails and Locomotives.—The Nickel Plate railroad has placed 10,000 tons of rails with Steel Corporation mills and has divided slightly less than 10,000 tons between the Bethlehem Steel Co. and the Inland Steel Co. These rails will cover the 1926 requirements of the Nickel Plate, the Clover Leaf and the Lake Erie & Western railroads. The Lima Locomotive Works has taken 25 locomotives for the Wabash and 10 for the Chicago & North Western.

Semi-Finished Steel.—There is still some inquiry for sheet bars for early shipment, but the leading local producer is committed for all of its December output. A northern Ohio mill that inquired for 30,000 tons of sheet bars and small billets for the first quarter is understood to have covered for its requirements. Considerable first quarter business is still being booked subject to trade paper quotations.

Sheets.—New business is not as active as it has been, but most mills have sufficient orders on their books to carry them well into the first quarter. With approach of inventory time, specifications have fallen

The market is firmer than it has been and most mills are holding to regular quotations. However, concessions of \$2 a ton can probably still be secured on early shipment orders.

Strip Steel .- Hot-rolled strip mills have comfortable backlogs, but some are not committed very far in the first quarter. The demand for cold-rolled strip steel continues fairly heavy. The market is firm at regular

Reinforcing Bars.—Plans are out for the lower foundations for the Union Station, Cleveland, which will probably require 1000 tons of reinforcing bars. inquiry is light. Rail steel bars are unchanged at 1.80c. to 1.90c.

Coke. — Two makers of high-grade Connellsville foundry coke have opened their books for contracts at \$5.25 and \$5.50, ovens, for shipment in open-top cars for the first half and at \$6.25 for the first quarter of next year, but there is evidently not much disposition among foundrymen to contract at the present time. For prompt shipment prices range from \$4.75 to \$6, ovens. Domestic coke is weak and the market shows little life. Ohio by-product coke for domestic use is quoted at \$7.25, ovens, for both nut and egg sizes, but this price might be shaded.

Old Material.—The market is weak and stagnant. There is no demand from consumers. Mills are not only well supplied, but with the approach of inventory time several have held up shipments and the scrap being offered is far in excess of the demands of dealers who are buying to fill old orders. Activity is confined mostly to heavy melting steel and blast furnace scrap. A few sales were made during the week at \$17.50 for heavy melting steel and at \$14.65 for borings and turnings, delivered to consumers in Cleveland. Blast furnace grades are slightly lower. Quotations on most grades are nominal.

We quote dealers' prices f.o.b. Cleveland per gross ton:

TOSS COIL.				
Heavy melting steel	!	\$17.00	to	\$17.50
Rails for rolling		16.75	to	17.00
Rails under 3 ft				20.00
Low phosphorus melting		19.00	to	19.25
Cast Iron borings		14.00	to	14.50
Machine shop turnings		13.50	to	14.00
Mixed borings and short turn	ings	14.00	to	14.50
Compressed sheet steel		15.50	to	16.00
Railroad wrought		14.50	to	15.00
Railroad malleable		20.50	to	21.00
Light bundled sheet stamping	8	12.50	to	12.75
Steel axle turnings		15.25	to	15.50
No. 1 cast		18.00	to	18.50
No. 1 busheling		14.25	to	14.50
Drop forge flashings		14.75	to	15.00
Railroad grate bars		13.75	to	14.00
Stove plate		13.75	to	14.00
Pipes and flues		11.50	to	12.00

Youngstown

Production at 90 Per Cent Rate—Holiday Suspension

Youngstown, Dec. 15.—Iron and steel production in the Mahoning and Shenango Valleys continues to average close to 90 per cent, though shipments are declining owing to year-end inventory taking by consuming interests. Of 43 blast furnaces in the Youngstown district, 26 are in action; 60 of 67 open-hearth furnaces, while Bessemer steel plants are active at 85 to 90 per cent. Active sheet mill capacity holds at 95 per cent, but there are moderate recessions in merchant steel bar, plate and lapweld pipe capacity. Strip mills are operating close to a capacity rate.

In the Mahoning Valley, most finishing mill depart-ments will suspend Thursday afternoon next week to permit employees to observe the Christmas and will remain idle for the remainder of the week.

Millwrights will be engaged during this suspension making needed repairs and overhauling. There will be no cessation of operations in departments requiring continuous operation.

The November payroll of \$6,717,508 by industries at Youngstown, chiefly iron and steel companies, brings the total disbursement for the first 11 months of 1925 to \$73,111,013, comparing with \$69,500,000 for the corresponding 1924 period. It is now assured that the 1925 payroll will reach 80 millions, comparing with an actual distribution of \$76,598,190 for the 12 months of last year. Employment has been well maintained in October and November, and will show up equally well in December, despite suspensions which will occur for the holiday season.

The William B. Pollock Co., blast furnace builder and fabricator of heavy steel plates, located at Youngstown, Ohio, is bringing to completion the rebuilding of two blast furnaces for the Carnegie Steel Co., one at the Ohio Works, Youngstown, and the other at Mingo Junction, Ohio. Both of these stacks will be ready for operation in January. The Pollock company is also operation, Onlo. Both of these stacks will be ready for operation in January. The Pollock company is also reconstructing a blast furnace in the East Youngstown group of the Youngstown Sheet & Tube Co., and this stack will be finished in February. A 400-ton stack which it is erecting in the Boston district for the Mystic Iron Co. will be completed in the next 60 to 90 days.

San Francisco

Utah and European Pig Iron Bought for First Quarter—Concrete Bars Weaker

SAN FRANCISCO, Dec. 15 (By Telegraph).—Business is confined to routine developments. Buyers show a stronger inclination to test steel prices, which, however, are slightly firmer than a week ago. In pig iron the principal development is the placing of first quarter In pig iron contracts for Utah and European iron, some of the contracts running into larger tonnages than the same buyers took for first quarter of this year. The number of contracts is about the same.

In the steel market the only price shading of importance is on concrete reinforcing bars, which are quoted at 2.85c., delivered. This price was obtained by a seller on 180 tons, but on another lot of 250 tons the price was 2.75c. per lb.

*Utah basic	0		0					0		0			0	0.		\$27.00	to	\$28.00
*Utah foundry, sll.		1.	.7	5	1	ti	0	2	3.	2	5		0	0	0	27.00	to	28.00
**English foundry	0		0		0	0	0			0	0		0		0			26.00
Belgium foundry						٠	0	۰	0	0	0		0	0	0	24.50	to	25.00
**Dutch foundry .		0						0	0	0	0		0	0	0			24.00
**Indian foundry .		0		0			0		0	0	0	0	0	٥	0	24.00	to	25.00
**German foundry		0						0				0		0	4			25.00

*Delivered San Francisco. **Duty paid, f.o.b. cars San Francisco.

Warehouse Business .- Individual orders are numerous but the general demand, according to jobbers, shows signs of slackening. Some jobbers look for higher quotations on nails and other wire products.

Merchant bars, \$3.30 base, per 100 lb.; merchant bars, \$\% in. and under, rounds, squares and flats, \$3.80 base, per 100 lb.; merchant bars, \$\% in. and under, rounds, squares and flats, \$3.80 base, per 100 lb.; soft steel bands, \$4.15 base, per 100 lb.; angles, \$\% in. and larger x 1½ in. to 2½ in., inc., \$3.30 base, per 100 lb.; channels and tees, \$\% in. to 2½ in. inc., \$3.90 base, per 100 lb.; angles, beams and channels, \$3 in. and larger, \$3.30 base, per 100 lb.; tees, \$3 in. and larger, \$3.30 base, per 100 lb.; universal mill plates, \$\% in. and heavier, stock lengths, \$3.30 base, per 100 lb.; spring steel, \$\% in. and thicker, \$6.30 base, per 100 lb.; wire nails, \$3.50 base, per 100 lb.; cement coated nails, \$3 base, per 100 lb.; No. 10 blue annealed sheets, \$3.75 per 100 lb.; No. 28 galvanized sheets, \$6 per 100 lb.; No. 28 black sheets, \$4.75 per 100 lb.

Cast Iron Pipe.-The city of San Diego has purchased 200 tons of 30-in. Class B pipe in the market from the United States Cast Iron Pipe & Foundry Co. Bids were rejected a week ago. Los Angeles has bought 956 tons under specification 782A and 812 tons of 6-in. Class B from the United States Cast Iron Pipe & Foundry Co. and 144 tons of Classes B and C from the American Cast Iron Pipe Co.

Coke.—A shipment of 5000 tons of European coke has been received here. Half of it is for distribution in southern California.

English beehive, \$15 to \$16 at incoming dock, and English by-product, \$12 to \$14; German by-product, \$11.50 to \$12.

Philadelphia

Railroads Want First Quarter Steel— Pennsylvania Buys Track Material

PHILADELPHIA, Dec. 15.—In open bids to the Norfolk & Western Railroad steel mills displayed a firm attitude on first quarter prices. Two Pittsburgh mills and an Eastern company quoted 2c., Pittsburgh, on shapes and bars and 1.90c. on plates. A Buffalo mill quoted bars at 2c., Buffalo. An Eastern plate manufacturer named 1.90c., mill, on the plates. The Norfolk & Western inquired for only 2000 tons of the three products. The order is reported to have been placed with a Pittsburgh company. The Baltimore & Ohio has sent out an inquiry for 8000 tons of bars, 6000 tons of plates and 3000 tons of shapes for first half, but most of the bids submitted are for first quarter only, the mills being unwilling to commit themselves at present prices for a half year. The Pennsylvania Railroad has ordered 2,000,000 or more tie plates and a correspondingly large quantity of track bolts and spikes. An inquiry for this road's first quarter requirements of plates, shapes and bars is expected soon. About 12,000 tons of plates, shapes and bars will be required for 1000 cars for the Reading Railroad.

required for 1000 cars for the Reading Railroad.

Aside from these signs of railroad activity, the steel market is extremely quiet. Some buyers are withholding specifications, which presumably will be released in the last week of the year so that deliveries will come after the inventory period. The pig iron and scrap markets are likewise very dull. Prices of pig iron remain very firm but scrap shows a little weakness.

Pig Iron.—The week's business has consisted of small lots of foundry iron and several thousand tons of low phosphorus iron. Foundry iron is firm at \$23, base, furnace, and as most of the furnaces have good order books for first quarter there is no pressure to sell. In fact, some furnaces are not making any general quotations, but have reserved a little tonnage with which to take care of additional requirements of their regular customers.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil\$23.76 to \$24	12
p. 20 Sil	.10
East. Pa. No. 2X, 2.25 to 2.75 sil. 24.26 to 24	.63
East. Pa. No. 1X 24.76 to 25	.13
Virginia No. 2 plain, 1.75 to 2.25	
sil	3.67
	0.17
Basic, delivered eastern Pa 23.00 to 23	3.50
Gray forge 23.00 to 23	3.50
	5.00
Standard low phos. (f.o.b. fur-	100
nace) 24.00 to 23	5.00
Copper bearing low phos. (f.o.b.	
	1 50

Ferroalloys.—Although a little first quarter contracting for ferromanganese has been done, most of the steel companies have refrained from ordering very far ahead. Current business consists of carload lots for prompt shipment. The price remains at \$115 for domestic or foreign alloy.

Billets.—Eastern mills now quote \$36, base, Pittsburgh, for billets. A sale of 1000 tons for first quarter is on this basis, with \$2 extra for carbon. Forging billets are generally quoted at \$41, Pittsburgh.

Plates.—Eastern plate mills are gradually getting the plate price up to 1.80c., Pittsburgh. Several mills are quoting this price for any delivery, but one or two are still making sales for immediate specification, at 1.70c. Most of the protections which were given prior to the advance have now been taken care of and the elimination of the lower quotations is being brought about. Locomotive inquiry has increased and prospects for the local locomotive works are said to be better than in some time. No award has been made of the four car floats to be built for the New York Central Lines, but it is expected that they will be built at the plant of the American Brown Boveri Electric Corporation. About 3000 tons of plates and 1000 tons of shapes will be required.

Structural Shapes.—Structural steel awards are in smaller volume, but fabricating shops are well filled

up with work for the next few months. Mill shipments of shapes are heavy, but new orders, not including current specifications, are less than shipments. Prices are slightly firmer, it being seldom that 1.90c., Pittsburgh, is shaded. On small lots some mills are getting 2c. The larger mills are quoting 2c., Pittsburgh, for first quarter.

Bars.—Bids submitted on bars to the Norfolk & Western Railroad bear out recent reports that 2c., Pittsburgh, is the price being named to the larger buyers on first quarter requirements. There was an effort to increase the first quarter price to 2.10c., but this has not succeeded except on small lots. The mills have good rolling schedules, but are having difficulty in getting consumers and jobbers to specify their December quotas. This is purely a year-end development, however, and there is every indication that contracts will be specified in full before the last day of the year, as much of the fourth quarter business was taken at 1.90c. Bar iron is in fair demand and the price remains at 2.22c., Philadelphia.

Sheets.—Despite reports of shading by one or two mills of as much as \$2 a ton, the sheet trade is less disturbed than on previous occasions when such price-cutting has occurred. Most of the mills have substantial backlogs and feel secure that in general the market will remain firm at least through first quarter. For sheet prices see page 1695.

Warehouse Business.—Demand for steel out of stock continues in moderately good volume. Price concessions are becoming less frequent. For local delivery jobbers quote as follows:

Soft steel bars and small shapes, 3.20c.; iron bars (except bands), 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ½ in, 3.50c.; round edge steel, planished, 4.30c.; tank steel plates, ¼ in. and heavier, 2.80c. to 3c.; tank steel plates, ¼ in. and heavier, 2.80c. to 3c.; tank steel plates, ¾ in. 3c.; blue annealed steel sheets, No. 10 gage, 3.50c.; black sheets, No. 28 gage, 4.65c.; galvanized sheets, No. 28 gage, 5.85c.; square, twisted and deformed steel bars, 3c.; structural shapes, 2.75c. to 2.90c.; diamond pattern plates, ¼ in., 5.30c.; ¼ in., 5.50c.; spring steel, 5c.; rounds and hexagons, coldrolled steel, 4.50c.; steel hoops, 4.25c., base; steel bands, No. 12 gage to ¼ in., inclusive, 3.90c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 6.50c.

Imports.—Pig iron receipts from abroad continue heavy, almost 12,000 tons having come in last week at Philadelphia as follows: From England, 6898 tons; Germany, 2050 tons; India, 1877 tons; Luxemburg, 980 tons, and Sweden, 100 tons. Other imports were: Iron ore from Sweden, 6486 tons; chrome ore from Portuguese Africa, 3600 tons; ferromanganese from England, 50 tons; steel blooms from France; 20 tons of tubes and 10 tons of bars from Sweden.

Old Material.—The scrap market is quiet, and there is a slight degree of weakness in prices without any important changes. One or two steel plants are picking up carload lots of heavy melting steel at \$17.50, and although brokers would not sell a tonnage at less than \$18, this latter price cannot be obtained from any mill. Not over \$15 is to be had for bundled sheets, machine shop turnings and stove plate for steel works

We quote for delivery, consuming points in this

We quote for delivery, consuming listrict, as follows:	g points	in	thi
No. 1 heavy melting steel		17.	50
Scrap rails	17.00 to		
Steel rails for rolling	18.50 to	19.	
No. 1 low phos. heavy 0.04 and	20.00 60	20,	00
under	22.00 to	22.	50
Couplers and knuckles	21.00 to	21.	
Rolled steel wheels	21.00 to	21.	
Cast iron car wheels	18.50 to	19.	
No. 1 railroad wrought	18.50 to	19.	
No. 1 yard wrought	17.00 to	17.	50
No. 1 forge fire	15.50 to	16.	
Bundled sheets (for steel works)	20.00 00	15.	
Mixed borings and turnings (for		200	00
blast furnace)	13.50 to	14	50
Machine shop turnings (for steel	10.00 10	LT.	00
WORKS)		15.	00
Machine shop turnings (for roll-		Lu.	00
ing mill)	15.00 to	15	=0
Heavy axle turnings (or equiva-	10.00 (0	10.	00
lent)	15.50 to	20	00
Cast borings (for steel works	10,00 (0	10.	00
and rolling mill)		9.5	00
Cast borings (for chemical plant)	17 00 40	15.	
No. 1 cast	17.00 to	17.	
Heavy breakable cast (for steel	18.00 to	19.	00
works)	****		
Railroad grate bars	17.50 to	18	
Stove plate (for steel works)		15	
Wrought iron and soft steel pipes		15	.00
and tubes (new specifications)			
Shafting			.00
Steel evice	23.00 to		.00
Steel axles	24.00 to	25	.00

NEW STEAM GENERATOR

Evaporates 35 Lb. of Water to 1 Sq. Ft. of Heating Surface per Hr.

What is regarded as a revolutionary development in steam generation for power purposes is a new steam generator, which in an installation in the plant of Taylor Brothers & Co., Ltd., in England, gave over 70,000 lb. of steam per hour from 2000 sq. ft. of heating surface. This corresponds to 35 lb. of steam per sq. ft. The development is one of the Combustion Engineering Corporation, New York, and comprehends the burning of pulverized coal under extremely high temperature conditions.

The combustion chamber may be described as amounting to a rectangular box on end with the sides of the box made up of boiler tubes. The spaces be-tween the tubes have fins, or extended surfaces, to se-cure an air-tight inclosure. The pulverized coal burn-ers are in the upper levels and in the corners of the box. The air delivered to the burners reaches them at an unusually high temperature for such practice, coming from an air preheater designed for the purpose. The main volume of supplementary air is forced downward through the chamber and the resulting gases, unusually high in temperature as stated, have a vortical action and pass rapidly downward into a settling chamber, so-called. The bottom of the combustion chamber is made up of plain boiler tubes, in a bank several tubes deep and spaced across the chamber bottom between water drums on two opposite sides of the boiler. The plain spaced tubes allow for the free passage of the gases into the settling chamber. All water circulating arrangements are outside of the tube cham-

The gases on reaching the settling chamber pass quickly to a steam superheater and thence through the air heater for the burners. The air heater, of course, works on the exchange principle of taking from the products of combustion the heat utilized for the preheating.

RAILROAD EQUIPMENT

Freight Cars Ordered Total 5325 and Inquiries Call for 2850-75 Locomotives Bought

With the letting of contracts by railroads for 5325 freight cars and inquiries for 2850, the railroad equipment market has had an active week. Demand for locomotives is also better, orders for 75 having been placed and inquiries pending call for 68. The principal items of the week follow:

The Reading has ordered 1000 steel gondolas-500 from the Bethlehem Steel Corporation, 250 from the Standard Steel Car Co. and 250 from the Pressed Steel Car Co.

The New York Central Lines have placed contracts for The New York Central Lines have placed contracts for 1550 freight cars, of which 500 steel hoppers will be built by the Pressed Steel Car Co., 550 steel hoppers by the Ralston Steel Car Co. and 500 automobile box cars by the Standard Steel Car Co. The New York Central has also distributed passenger and baggage equipment orders as follows: To the Pullman Car & Mfg. Corporation, 35 coaches and 20 dining cars; to American Car & Foundry Co., 40 coaches and 25 baggage cars; to the Standard Steel Car Co., 25 coaches and 32 baggage-mail cars; to the Merchants' Despatch Trans-portation Co., 20 milk cars; to the Pressed Steel Car Co., portation Co., 20 milk cars; to the Pressed Steel Car Co., 50 coaches and 9 passenger-baggage cars. This road also bought 10 electric engines and one freight Diesel electric engine. It will be built jointly by the American Locomotive Co. and the McIntosh & Seymour Corporation.

The Rochester & Pittsburgh Coal & Iron Co. has divided an order for 500 mine cars between the American Car & Foundry Co. and the Bethlehem Steel Corporation.

The New York, New Haven & Hartford has ordered 6 dining cars from the Pullman Car & Mfg. Corporation.

The Kansas City, Mexico & Orient will build 50 box cars in its own shops.

cars in its own shops,

The Delaware, Lackawanna & Western has ordered 50 ballast cars from the Rodgers Ballast Car Co. and that company has in turn placed the order with the American Car & Foundry Co.

The Lehigh Valley has ordered 1100 cars, of which 500 steel hoppers and 100 steel gondolas will be built by the Bethlehem Steel Corporation and 500 automobile box cars by the American Car & Foundry Co.

The Boston Elevated has ordered 60 elevated railroad cars from the Standard Steel Car Co.

from the Standard Steel Car Co.

The Union Pacific has inquired for 1000 50-ton steel ballast cars and 1000 automobile box cars.

The Florida East Coast Railway is inquiring for 50 passenger coaches and 50 caboose cars.

The Mobile & Ohio is inquiring for 10 passenger coaches.

The Northwestern Refrigerator Lines have ordered 200 40-ton refrigerator cars from the American Car & Foundary Co.

The Long Island has ordered 20 passenger coaches from

The Long Island has ordered 20 passenger coaches from the American Car & Foundry Co.

The Missouri Pacific has ordered 6 steel baggage cars from the American Car & Foundry Co.

It is reported that the New York Central will build 18

baggage cars in its West Albany shops.

The Atchison, Topeka & Santa Fe has ordered 15 Santa Fe type locomotives from the Baldwin Locomotive Works. The Florida East Coast is inquiring for 38 locomotives— 20 Mikado type and 18 mountain type.

The Missouri Pacific has issued an inquiry for 30 loco-motives, of which 15 are to be switching engines, 10 Mikado type and 5 Pacific type.

The St. Louis-San Francisco has ordered 25 locomotives

from the Raldwin Locomotive Works.

The Wabash has placed 25 locomotives with the Lima Locomotive Works.

The Chicago & North Western has placed 10 locomotive with the Lima Locomotive Works and will take prices on O convertible coal cars.

The Atlantic Coast Line has placed 100 ballast cars with

the Virginia Bridge & Iron Co., 525 box cars, and 300 hopper bottom coal cars with the Pressed Steel Car Co.

The Chicago & Eastern Illinois is inquiring for 500 70ton hopper bottom coal cars.

The Missouri Pacific is asking prices on 8 coaches, 4 chair, 4 baggage and coach, and 2 passenger and mail cars. The Santa Fe is in the market for 9 diners

Canadian Scrap Market Declines

TORONTO, ONT., Dec. 15 .- Because of heavy consumer buying during the month of November, demand has slumped both in the Toronto and Montreal markets. In the Montreal district many consumers laid in large tonnages of old material against future needs, and it is stated that they are taking advantage of their position to hammer down prices. A week ago advances of from 50c. to \$1 a ton were reported in many lines of old material, but this week dealers have gone back to their old buying prices. In the Toronto district a fair spot demand is reported from consumers who have not covered by contract for the remainder of the year. Dealers who until recently were offering prices slightly above market, buying on speculation, are not now inclined to pay even the list prices, but are seeking bargains. Dealers' buying prices are as follows:

Per Gross Ton	
Toronto	Montreal
Steel turnings \$10.00	\$7.50 7.50 6.50 10.00 13.00 17.00 19.00
Per Net Ton	
Standard car wheels 16.00 Malleable scrap 14.00 Stove plate 13.00 No. 1 machinery cast 17.00	15.00 13.00 13.00 16.00

Scrap Prices at Detroit Unchanged

DETROIT, Dec. 15 .- There has been no change in the general tone of the market on old material and dealers seem to be marking time until there is some buying interest, as after Jan. 1. The melt in the district is on a reduced basis this month, and probably will not increase materially until after Jan. 15. All lines of manufacturing are anticipating high production during the first quarter of 1926. Prices same as during the past two weeks.

FABRICATED STEEL

Awards of the Week Slightly Under 25,000 Tons While Inquiries Exceed 22,000 Tons

Although less than the average rate of structural steel contracting in October and November, the lettings of the past week were in fairly good volume considering that this month is usually considered as "between seasons." The total of awards was just under 25,000 seasons." The total of awards was just under 25,000 tons. Inquiries total more than 22,000 tons. The largest award was 4400 tons for a Newark department store. The largest inquiry, 6800 tons, is for New York subway work. Awards follow:

L. S. Plaut & Co., department store, Newark, N. J., addition, 4400 tons, to Shoemaker Bridge Co.

Breakers Hotel, West Palm Beach, Fla., 850 tons, to Virginia Bridge & Iron Co.

Lehigh Valley Railroad, bridge at Coxton, Pa., 1300 tons, to American Bridge Co.

Minskoff apartment building, 119-123 West Seventy-second Street, New York, 600 tons, to Harris Structural Steel Co.

Bing & Bing, apartment building, 26-40 West Fifty-fourth Street, New York, 2300 tons, to A. E. Norton, Inc.

Hotel at Virginia Beach, Va., 800 tons, to Richmond Structural Steel Co.

Du Pont plant Carney's Point, N. J., 1000 tons, to Belmont Iron Works.

New York Central, bridge, 225 tons, to American Bridge Co.

Big Four Railroad, bridge, 100 tons, to an unnamed fabricator.

McCrory Stores Corporation, mercantile building, St. uis, 770 tons to Mississippi Valley Structural Steel Co., St. Louis.

Adams Street Bridge, Chicago, 1425 tons, to Strobel Steel Construction Co., Chicago.

Union Pacific System, bridges in Utah, 1400 tons, to American Bridge Co.

University of Iowa, Iowa City, Iowa, field house, 1150 tons, to Pittsburgh-Des Moines Steel Co.

Houston ship channel bridge, Houston, Tex., 700 tons, to Pennsylvania Car Co.

Western Pacific Railroad Co., bridges in Nevada, 650 tons, to Virginia Bridge & Iron Co.

Canada Dry Ginger Ale, Inc., Maywood, Ill., 375 tons, to McClintic-Marshall Co.

Calumet and Fenger high schools, Chicago, 2700 tons, to A. Bolters Sons, Chicag

Girls' Catholic High School, Philadelphia, 1000 tons, to McClintic-Marshall Co.

International Motor Corporation, plant at Allentown, Pa., 2000 tons, to McClintic-Marshall Co.

Hercules Cement Corporation, Philadelphia, crane runway building, 250 tons, to Belmont Iron Works.

Office building, Post Street, San Francisco, 400 tons, to Central Iron Works. Apartments, San Francisco, 180 tons, to Central

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Loft building. West Thirty-seventh Street, New York, 600 tons.

Loft building, 584 Eighth Avenue, New York, 1000 tons. Garage, Eleventh Avenue and Fifty-eighth Street, New York, 400 tons.

Catholic Seminary, Overbrook, Pa., 900 tons.

Iron Works.

Young Women's Christian Association building, Washington, 500 tons.

Hotel, Twentieth Street, Philadelphia, 700 tons. New York subways, section 4 A, 6800 tons; bids close

Acca Temple, Richmond, Va., 1000 tons. Baseball grandstand, Newark, N. J., 600 tons.

Pennsylvania Railroad, machine shop at Olean, N. Y., 500

Valley Railroad, bridge, 1200 tons Lehigh

New York subways, platform extensions in Brooklyn, 350 tons.

High Bridge, New York, new steel work for strenghtening, 1800 tons; bids being taken by New York City water department.

Masonic Temple, Cincinnati, 2500 tons; general contract to Ferro Concrete Construction Co., Cincinnati.

U. S. Engineer Office, Louisville, bear-trap leaves for dams 45 and 46, Ohio River, 275 tons; bids in. S. S. Kresge Co., Columbus, Ohio, building, 200 tons; bids close Dec. 21.

Big Four Railroad, bridges, 150 tons; bids close Dec. 17. Big Four Railroad, bridges, 150 tons; bids close Dec. 17.
Mississippi River Commission, First and Second Districts, 1006 McCall Building, Memphis, Tenn., two steel hull work boats, 150 tons; bids in.
U. S. Engineer Office, Louisville, steel sheet piling for dams 46, 50, 52 and 53, Ohio River, 2100 tons; bids close Dec. 28

Dec. 28.

International Harvester Co., Fort Wayne, Ind., forge and die shop, 390 tons.

Starved Rock dam, near Ottawa, Ill., 200 tons. Theater, Springfield, Ill., 700 tons.

California Packing Corporation, warehouse in Hawaiian Islands, 850 tons

Whitcomb Hotel, San Francisco, addition, 800 tons.

REINFORCING STEEL

Bookings of Concrete Bars Total 4100 Tons

Awards of reinforcing steel bars, reported from all sections of the country, total nearly 4100 tons. The largest individual letting, 1000 tons for New York subway work, went to Igoe Brothers. Pending work totals 6100 tons. Lettings include:

Calumet High School, Chicago, 650 tons to Joseph T. Ryerson & Son.

Hendrey House, Ridge Avenue, Evanston, Ill., 100 tons of rail steel to Calumet Steel Co.

Anatomy Building, Medical University, Memphis, Tenn., 150 tons to Laclede Steel Co.

Ear, Eye and Nose Hospital, Memphis, Tenn., 40 tons to Laclede Steel Co.

Fenger High School, Chicago, 700 tons to Truscon Steel Co. Interborough Rapid Transit Co., Coney Island repair shop, 350 tons of wire mesh and 150 tons of bars to

Section of New York subway work, F. C. Crawford, Brooklyn, general contractor, 1000 tons to Igoe Brothers. Sterling & Welsh Co., Cleveland, warehouse, 550 tons to Bourne-Fuller Co.

Concrete Steel Co.

Kirkland pumping station, Cleveland, 150 tons to Bourne-

California Poultry Co., building, San Francisco, 105 tons to local jobber.

Catholic orphanage, Los Altos, Cal., 150 tons to Gunn, Carle & Co.

Projects Pending

Illinois State highway work, Route 10, Section 14, 200 General contractors, Johnson & Sherwood, Palestine, Ill.

Bridge for city of Rockford, Ill., 300 tons.

Bridge for city of Milwaukee, 400 tons. General contractor, Stein Co., Milwaukee.

Illinois State road work, 200 tons; general awarded to S. & H. Construction Co., Milwaukee.

Iowa road work, 100 tons; general contract awarded to Central Engineering Co., Davenport, Iowa.

Crawford Avenue bridge, for Sanitary District, Chicago, 400 tons. Low bidder on general contract, Central Dredging Co.

St. Leo School, Chicago, 150 tons. Joseph McCarthy, architect.

American Can Co., Maywood, Ill., factory building, 200 ns. General contract awarded to Starrett Bros., University of Chicago, field house, 135 tons.

Swern, architects.

Bell & Howell Co., Chicago, factory building at Larchmont and Ravenswood Avenues, 135 tons; general contract

awarded to Charles D. Johnson.

Henry Apartment, Chicago, 500 tons; general contract awarded to McLennan Construction Co.

Missouri Highway Commission, Jefferson City, miscellaneous general road contracts awarded Dec. 10, 500 to

Masonic Temple, Cincinnati, 400 tons; general contract Ferro Concrete Construction Co., Concinnati. Union Station, Cleveland, lower foundations, 1000 tons. City Buffalo, garbage incinerator, 200 tons. Section of subway, New York, Rosoff Corporation, general

contractor, 200 tons.

Bonnell Motor Co., plant, Newark, N. J., 800 tons.

National Grocery Co., warehouse, Jersey City, N. J., 600 tons.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

Copper, New York			Tin (Spot)	L	ead	Zine		
Dec.	Lake	Electro- lytic*	New York	New York	St. Louis	New York	St. Louis	
9 10 12 14	14.25 14.25 14.25 14.25 14.25	13.75 13.75 13.75 13.75 13.75 13.75	63.50 63.1234 62.95 62.0734 61.374	9.25 9.25 9.25 9.25 9.25 9.25	9.00 9.00 9.00 9.00 9.00	9.05 9.10 9.00 9.00 9.00 8.90	8.70 8.75 8.65 8.65 8.65 8.65	

*Refinery quotation; delivered price 1/4 c. higher.

New York

NEW YORK, Dec. 15.

The markets are only moderately active with price tendency easy. The copper market is quiet with no improvement in values. Moderate sales of tin have been made at falling prices. The lead market is very quiet with quotations unchanged. Except for prompt metal, the zinc market is lower and not particularly active.

Copper.—It develops that, within the last ten days, large sales of copper were made to domestic consumers with most of the business conducted very quietly. It is acknowledged that close to 60,000,000 lb. changed hands, practically all of it at 14c., delivered. Consumers, who have been watching the market closely, evidently concluded that the metal was cheap at that price. Most of the buying was done just prior to Dec. 10. Since then the statistics have been published, showing a decrease in producers' refined stocks of 5017 tons with an increase in blister stocks of 2631 tons in November. Despite this fairly favorable showing, the market has not responded. The opinion is quite prevalent that, until export sales regain their normal volume, there will be no decided improvement in the copper market. On the publication of statistics large producers advanced their quotations to 14.12½c., delivered, but there is still metal enough available at 14c. to satisfy current demand. Lake copper is quoted at 14.25c., delivered,

Tin.—Sales of Straits tin for the week ended Saturday, Dec. 12, amounted to about 600 tons. The market has been very dull, but consumers have kept in close touch with it each day waiting, as a rule, until the following day before making any purchases. There has been no particular pressure to sell, with two exceptions, one seller during the week being always ready to do business and the other manifesting anxiety to do so. Yesterday 300 to 350 tons changed hands. On the three days on which most of the business was done, the sales involved prompt and nearby tin, mostly spot, ex-steamer at dock and December delivery. The sales of 900 to 1000 tons referred to were made mostly to consumers. Spot Straits tin today was quoted at 61.37½c., New York, a decline of 2c. from the quotation a week ago. Sales today were light at 61.25c. to 61.50c. London prices today were decidedly lower than a week ago, with spot standard quoted at £275 15s., future standard at £272 5s. and spot Straits at £277 5s. The Singapore price yesterday was £282 10s. London prices today were £4 per ton less than yesterday due to the economic situation in France and to sales in Singapore today of 450 tons, the largest for any one day in a long time. Arrivals thus far this month have been 2525 tons, with 6028 tons reported afloat.

Lead.—The situation has changed but little. The leading interest continues to quote as its contract price 9.25c., New York, and is evidently doing a fair business. The leading interest in the West is quoting 9.15c., New York, with other sellers as low as 9c. Demand is light and buyers are not committing themselves toward the close of the year.

Zinc.—The feature of the week has been the announcement by the American Zinc Institute of statistics for November which show another decrease in

stocks of slab zinc, bringing the amount on hand Nov. 30 to 60,922 tons, or the lowest in many months. The effect of this has been to stiffen prices, particularly for December, which are at a considerable premium over January and other future deliveries. Demand is only moderate with practically none for export. Prime Western zinc for December-January shipment is quoted at 8.50c. to 8.60c., St. Louis, or 8.85c. to 8.95c., New York. Prompt and December is quoted at 8.70c. to 8.75c., St. Louis.

Nickel.—Ingot nickel in wholesale lots is quoted unchanged at 34c., with shot nickel at 35c. and electrolytic nickel at 38c.

Antimony.—The scarcity of Chinese metal grows more pronounced and spot delivery is quoted today at 22c., New York, duty paid, with late December arrival sold at 21.87½c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 28c., delivered.

Old Metals.—The market is generally unchanged. Dealers' selling prices, in cents per lb., are as follows:

Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.50
Heavy machine composition	10.00
Brass, heavy	9.00
Brass, light	7.75
No. 1 red brass or composition turnings	9.25
No. 1 yellow rod brass turnings	9.50
Lead, heavy	7.00
Lead, tea	5.75
Cast aluminum	22.00
Sheet aluminum	22.00

Chicago

DEC. 15.—Lake copper is unchanged and tin is weaker in a quiet market. Lead and zinc are also quoted lower than the ruling prices of a week ago. Antimony is stronger largely because the supply in sight for delivery after Jan. 1 is small. The old metals market is quiet and several commodities have gone to lower levels. We quote, in carload lots: Lake copper, 14.25c.; tin, 63.50c.; lead, 9.15c.; zinc, 8.80c.; in less than carload lots, antimony, 24c. On old metals we quote copper wire, crucible shapes and copper clips, 11c.; copper bottoms, 9.25c.; red brass, 9c.; yellow brass, 8c.; lead pipe, 8c.; zinc, 5.25c.; pewter, No. 1, 37c.; tin foil, 44c.; block tin, 52c.; all being dealers' buying prices for less than carload lots.

Non-Ferrous Rolled Products

Contrary to expectations, list prices, f.o.b. mill, on brass and copper products have not declined. Zinc and lead sheets also remain unchanged. For New York warehouse prices, see page 1726.

List Prices Per Lb., f.o.b. Mill

Colorado Structural Mill

The Colorado Fuel & Iron Co., Denver, has announced plans for the construction of a 24-in. combined structural and general utility mill at its Minnequa plant in 1926, at a cost of \$1,500,000. It will be the first structural mill in the Rocky Mountain district. It will have capacity to roll I-beams up to 15 in., channels of the same size, and angles up to 8 x 8 x 1 in.

COORDINATED STATISTICS

Need for Business Figures as Guides to Policies Stressed at Distribution Conference

WASHINGTON, Dec. 15 .- Need for systematic collection of statistics, as a first step in the elimination of immense wastes in distribution, due to wide market fluctuations, are pointed out in a report submitted by a committee of Government officials and business executives, of which Owen D. Young is chairman, to the National Distribution Conference at its meeting in Washington today under the auspices of the Chamber of Commerce of the United States. The report represents the first concerted move on the part of American business to avert the disastrous boom and slump which result in waste and extravagance and subsequent stagnation and unemployment.

Secretary Hoover, who selected the members of the committee at the request of the conference, said, in outlining its purposes: "We are almost wholly lacking in the basic data as to distribution. It is my hope that this committee may sponsor and direct a broad inquiry into the business statistics now available and into the needs of the various branches of industry in the collection of additional figures, and make recommendations as to the best methods, public and private, of obtaining a more accurate knowledge of the marketing areas, and so approach more intelligently a discussion of wastes in distribution."

Among the recommendations of the committee are the following:

1. That an exhaustive study be made of present of statistics on distribution;

That an interdepartmental committee be organ-ized to coordinate the work of Government agencies publishing statistical summaries covering distribution;

That the specialists in organizations, both public and private, engaged in the collection and interpreta-tion of business figures, undertake collectively the

standardization, simplification and improvement of statistics of this kind,

4. That trade associations carry on the work of collecting data on distribution in their respective in-dustries and the collective study of the elimination of

waste;
5. That business men, both as individuals and as members of their trade groups, give serious consideration to the need for a census of distribution comparable to the Census of Manufacture.

"It seems to us," the committee says, "that the ideal would be to have statistics vital to the industries on the one hand, in terms of intimate information, and vital to all our people in terms of economic surveys, flowing as a stream from its many sources and many branches to a common pool of ordered knowledge, there mobilized for economic consideration of the country as a whole, and in turn flowing back to industry in terms of a composite picture of the ebb and flow of trade.

Waste Flows from Disorder

"We conceive that our present statistical situation follows, not from the want of ability and effort in the various collecting and interpreting agencies, whether private or public, but rather that waste flows from disorder. If we may order this effort through a com-mon understanding of our general needs, we will have arrived at an ideal of attainment in obtaining statistics of business and industry."

Any doubt that might have existed as to the legality of the collection of such statistics by trade associations, the committee holds, has been cleared away by recent decisions of the United States Supreme Court. "Business statistics," the committee concludes, "are the only ffective guide to balanced production and distribution. They are the only means for coordinating demand with production and uninterrupted employment. Their results would be felt by every human being in the country, from the owner of the largest factory to the humblest workman of the field."

PAYS TO TEACH WORKERS

Executives Find Education Smooths Out Labor Troubles

Employee representation, not as a system of industrial ethics, but as a useful tool of management, was the subject of a conference held at Kansas City, Nov. 30-Dec. 1, by the production executives' of the American Management Association. The sessions were devoted to discussions of methods. purposes and high ideals, the rights of capital and labor, and the desirability of fair dealing were taken for granted, and the 150 operating executives present got down solidly to the details of practical administra-

Sentiment of the meeting was to the effect that employee representation has passed out of the theoretical stage. It has come to be recognized as a sound system of labor management, suited to the needs of some companies and unsuited to others. The employer who adopts it should know why he does so. He should not inaugurate a representation plan simply because it is the popular thing to do; even less should he start it in an effort to suppress a union organization campaign or to "put over" some predetermined program like a reduction of wages. It is to be assumed that when a company adopts employee representation it is the purpose of the management to deal fairly with the working force. Thereafter the emphasis comes to be placed less upon motives and more upon practical and workable methods of administration.

But in spite of this increasing emphasis upon methods, there is still a wide variation between representa-tion plans of different companies. There is no sign tion plans of different companies. of uniform practice as regards eligibility of representatives, separate meetings for representatives of management and of employees, methods of appeal, or final authority in case of disagreement. This is perhaps a healthy symptom; certainly it is no occasion for con-

cern, provided each company adopts methods suited to its own needs.

Increased emphasis is being laid upon mutual understanding. Employers are learning that wage earners can be trusted with facts about business and that these facts when properly understood are among the surest safeguards against destructive and unsocial doctrines. Forward looking managers are making earnest efforts to give employees sound ideas about economics. business principles, and the problems of their own com-Employees are responding to this confidence by showing genuine desire for knowledge and an increasing disposition to sympathize with the problems of management. At the same time employers are making progress in understanding the needs, prejudices and viewpoints of labor.

The wage earner is growing in importance as a capitalist. Discussion of employee representation leads frequently into such subjects as savings plans and stock ownership. Sale of stock to employees is becoming more widespread. The practice has its dangers as well as its elements of advantage.

There is a growing recognition that the administration of a representation plan, as of all the other features of a labor policy, is a responsibility of management. The notion that this responsibility can safely or appropriately be shifted to a personnel department is rapidly vanishing. The industrial relations specialist has found his true place as a staff adviser, and line officials are learning-if they have not already learned that labor management is essential to production.

Bureau of Standards tests have been made on a model of a tall building, to determine the effect of high winds. The wind pressure was directed against various sides of the model and the forces tending to overturn and to twist it were computed. Measurements were made at 70 places on the face of the model and at 49 places on top, with the wind coming from 13 directions at velocities reaching 100 miles per hour.

PERSONAL

Charles L. Gilliatt, president Norfolk Iron Co., Norfolk Downs, Mass., was re-elected president of the Employers' Association of Eastern Massachusetts, at the annual meeting held last week.

Dr. Arthur Sauveur, professor of metallurgy at Harvard University and an honorary member of the American Society for Steel Treating, was the guest of the Boston chapter of the society on Friday evening, Dec. 4, at Massachusetts Institute of Technology. He gave an address on the directional properties of steel.

Cummings C. Chesney, general manager Pittsfield. Mass., works General Electric Co., has been nominated for president American Institute of Electrical Engineers. A year or so ago he was awarded the Edison medal for research work.

Clayton Mark, president of Clayton Mark & Co., 111 West Washington Street, Chicago, has been reelected president of the Chicago Civic Federation.

J. M. Mercer, formerly salesman in the Chicago office of the Concrete Steel Co., has been transferred to the Indianapolis, Ind., office of that company.

J. H. Sutherland, formerly with the Ford Motor Co. of Canada, has been appointed Detroit district sales representative by the Pittsburgh Valve Foundry & Construction Co., succeeding G. Howard Boddy. Mr. Sutherland was active in the designing and construction of the new Walkerville power plant of the Ford Motor Co.

Henry C. Houck, assistant general merchandise manager General Electric Co., has been appointed manager of the merchandise department at the Bridgeport works of the company. Mr. Houck entered the employ of the company in 1899 in the testing department. In 1902 he was sent to the Cleveland office as lighting apparatus salesman. Later he became manager of the supply department in the Cincinnati district and later assistant district manager. In 1912 he was recalled to Schenectady as assistant manager of the supply department. In 1922, when the merchandising department was formed, he was made assistant to G. P. Baldwin, then manager, who, a week ago, was promoted to vice-president in charge of railroad electrification activities.

Harvey H. Miller, general sales manager, and Walter S. Taylor, manager engineering department American Laundry Machinery Co., Cincinnati, have been elected members of the board of directors.

R. B. Sinnock and C. H. Adams have joined the Climax Engineering Co., Clinton, Iowa, as sales representatives. Mr. Sinnock will handle sales of Climax gasoline engines in the territory adjacent to Clinton. He was previously a member of the sales force of the Dayton-Dowd Co., Quincy, Ill. Mr. Adams will travel throughout the southeastern portion of the United States.

L. C. Deckard, who recently severed his connection with the Motch & Merryweather Machinery Co., has become associated with the Laughlin-Barney Machinery Co., Union Trust Building, Pittsburgh.

George H. Criss has been appointed manager of the H. E. McCoy Co., 1023 Bessemer Building, Pittsburgh, sales representative for Baker industrial tractors and trucks in Western Pennsylvania and West Virginia. Mr. Criss, associated with the McCoy company for more than five years, has been identified with the sales of electrical machinery in the Pittsburgh district for nearly 25 years.

Leonard J. Buck has joined William H. Muller & Co., Inc., 11 Broadway, New York, as director and vice-

president. Mr. Buck was connected with Buck, Kiaer & Co., Inc., 9 East Forty-sixth Street, New York, and also was sole United States sales representative of the British America Nickel Corporation. Buck, Kiaer & Co., Inc., have been representatives in the United States for the fluorspar mines of the Blackwell interests of Liverpool. William H. Muller & Co., Inc., has taken over the raw material department of Buck, Kiaer & Co., and Mr. Buck will be in charge of the Muller ore department, handling the sale of foreign iron ores, as well as manganese ore under the agency contract with the Harriman interests.

Fred Hubbard has been appointed consulting engineer by the Standard Slag Co., Youngstown, Ohio, operating 17 plants throughout the Middle West for the reduction of blast furnace slag. He has been engaged in research work for the Standard company, and in his new duties will continue such work, besides acting as engineer consultant for the sales department and the plant superintendents. He was formerly a civil engineer for the Carnegie Steel Co. in the Youngstown district.

John L. Spitzer, who has been connected with the E. B. Leaf Co., iron and steel scrap, 152 West Forty-second Street, New York, for about 10 years, has resigned and is now in business for himself as the J. L. Spitzer Co., 51 East Forty-second Street, New York. Mr. Spitzer will buy and sell iron and steel scrap as a broker.

To Effect Permanent Trumbull Steel Organization

Youngstown, Dec. 15.—A meeting of directors of the Trumbull Steel Co., Warren, is scheduled for tomorrow. The intention is to effect a permanent organization, following changes which have been instituted since the resignation in the summer of Jonathan Warner, founder and former president of the company. Philip Wick, Youngstown, one of the largest holders of common stock in the company, is mentioned as likely to be named permanent president. Mr. Wick has been acting as temporary president since August.

acting as temporary president since August.

Charles A. Elliott, superintendent of the South Side works of the Jones & Laughlin Steel Co., Pittsburgh, has been selected as vice-president and general manager and will be elected at the meeting of the directors on Wednesday. Before going to the Jones & Laughlin company a year ago, he was connected with the Weirton Steel Co.

OBITUARY

BRIG.-GEN. ROGER D. WILLIAMS, 69 years of age, president Lexington Engine & Boiler Works, died suddenly Dec. 12 at his home, being stricken while apparently in good health. General Williams was active in military, civic, social, political and field sport circles of the State. Identified with the Kentucky National Guard for more than 30 years, he served overseas in the late war, saw service in an Indian uprising and in Mexico. A widow, son, daughter and sister survive.

HENRY A. WEEKS, for 20 years associated with the W. F. Robertson Iron & Steel Co., Cincinnati, died at Christ Hospital in that city Dec. 7, following an illness of two months. He was widely known in iron and steel circles in the Middle West and was one of the outstanding figures in the Masonic order in Ohio. He was born at Cherry Valley, Ontario, in 1861. He was formerly manager of the Tower Mfg. Co., Madison, Ind., a subsidiary of the Robertson company. He is survived by a wife and two daughters.

Economy in Materials Handling

(Concluded from page 1670)

It seems probable that the above exceeds the average for products of our factories, and is obviously excessive for the products of farm, forest and mine. Neverth less the true averages, if ever ascertained, will no doubt be impressive in the extreme.

Materials Handling in Manufacturing

The fundamental process of systematizing the layout of the manufacturing plant in order to provide for a continuous flow of materials with a minimum of handling operations has become usual practice wherever new construction or reconstruction renders it possible to do so. There is also in evidence a more general realization than formerly that efficient production is possible only when the manufacturing plant is constructed to fit a carefully devised and inherently efficient industrial process which avoids unnecessary handling of product, and in which the type of handling equipment chosen is such as will cooperate with and facilitate productive operations.

Notable progress has been made in adapting and applying conveying equipment for moving product through relatively short distances, and for a group of operations to be conducted in an uninterrupted sequence. The ability of such a handling equipment to hold the output of a group of operators to a predetermined reasonable rate of production has favorably affected production costs, while reducing the cost of handling product almost to the vanishing point.

handling product almost to the vanishing point.

For comparatively long movements, and those which must traverse variable routes, the electric plat-

form, or lift truck, is finding a continually widening field of application. The lift truck, either hand- or power-propelled, with its accompanying materialcarrying platforms, finds special adaptation in moving finished machine parts which would be liable to injury through repeated handlings of individual pieces.

An internal transportation system for the industrial plant, consisting of electric or gasoline-driven tractors and trailers and usually operating on a fixed schedule, has become standard practice in plants where the tonnage of materials to be interchanged between departments or buildings is considerable. The ability of the electric truck or tractor to operate in cooperation with elevators in buildings several stories in height affords an excellent solution of an otherwise difficult problem.

For handling heavy articles the overhead traveling crane, one of the earliest instruments in materials handling, continues its supremacy as the most adaptable and efficient equipment for general handling operations. A variation in former practice is found in the increased number of cranes usually provided to serve a given area in order to reduce lost time in waiting for a crane to become available; an increase in operating speeds is also noted, this being done in order to reduce the time consumed in each operation performed.

For miscellaneous handling operations in buildings not exceeding two stories in height, and for specialized operations where lifting as well as conveying motions from bay to bay or from building to yard are essential, the monorail electric hoist, either cage- or floor-operated, seems to be indicated. Recent development has been in the direction of small floor-operated units for serving individual machines or operations, and for handling light loads formerly moved by hand.

FENCE FROM SCRAP PIPE

Oxy-Acetylene Blow Pipe Cuts and Welds Pipe for Posts and Gates

A new use for scrap pipe has been developed through the use of the oxy-acetylene blow pipe, according to a monograph prepared by H. G. Edwards, Linde Air Products Co., New York. One large plant recently felt the need for a strong, yet not ungainly, fence with an impressive gateway. An ingenious employee saw the connection between the works scrap yard and the oxy-acetylene blow pipe and, as a result, sketches were made and work started.

In Each Post U-Shaped, Cuts Were Made Forming Tongues to Hold the Fence Wire

In Constructing the Gate way Carefully Graded Lengths of Pipe Were Welded to a Straight Supporting Cross-Beam of Heavier Pipe. Two bent pipe lengths rounded off the top of each large gate

The first step consisted of providing pipe of correct diameter to proper length. This was readily done with the cutting blow pipe. Short pieces, on the other hand, were welded together. When a good supply of usable lengths was on hand, assembling began.

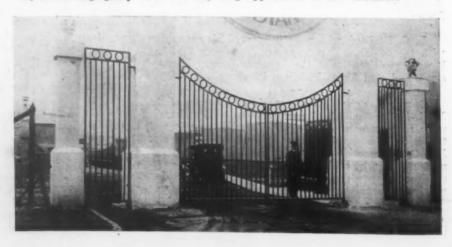
The fence was made with all joints welded and heavy wire netting was used for covering between posts. To attach the netting to the posts, U-shaped cuts were made in each post by means of the blow pipe, and the tongue formed was bent inward over strands of the wire

Making Attractive Gates

In constructing the gateway carefully graded lengths of pipe were welded to a straight supporting cross-beam of heavier pipe; two bent pipe lengths rounded off the top of each large gate. These graceful bends were made after heating the pipe with an oxyacetylene flame. Then cross-sections of large diameter pipe were cut with the blow pipe and these, welded at intervals along the top of the gates, added to their attractiveness.

Using the same general methods, smaller sidewalk gates were made. Concrete gate posts 3½ ft. square gave an imposing appearance to the entrance.





BELGIAN SEAMLESS TUBES

United States Trade Commissioner Reports on Methods of Usines à Tubes de la Meuse

SO much interest has been aroused in this country by the fairly large importations of European seamless tubing, particularly the large sizes not made by American mills, that the Bureau of Foreign and Domestic Commerce has obtained a special report on the plant of the leading Belgian manufacturer, the Usines à Tubes de la Meuse, which in common with German and French producers has been shipping its product to the California oil fields.

The report says that the Usines à Tubes has done a very profitable business in America, but the director of the company, Lucien Wauthier, has told E. V. D. Wight, Jr., assistant trade commissioner for the United States in Belgium, that he does not count too heavily on America as a permanent customer, in view of installations of equipment for making seamless tubing by the Mannesman process in this country. He expects that within a few years the United States may become self sufficing. In the meantime the Belgian company is developing its export trade throughout the world.

The Belgian metallurgical industry, Mr. Wight reports, numbers two plants exclusively devoted to the production of tubes and steel tubing. Of these the more important is the Usines à Tubes de la Meuse, its output being 3000 tons per month, which is six times greater than that of its Belgian competitor, the Tubes de Nimy. Moreover, the Usines à Tubes alone produces all types of tubes, including not only butt welded but qualities manufactured by the most recently perfected seamless processes. Mr. Wight's report goes on to say:

"The Usines à Tubes de la Meuse was founded June 24, 1911, with a capital of 5,500,000 francs. This sum has since been increased to 20,000,000 francs; bonded indebtedness on June 30, 1924, amounted to 9,852,000 francs. The French Société d'Escaut et Meuse d'Anzin of Paris was instrumental in forming the new company in 1911, bringing to the association its tube factory in Val-Benoit-Liège and important property at Flémalle-Haute. At the same time two large Belgian metallurgical firms, Société John Cockerill and Société d'Ougrée-Marihaye, subscribed the remainder of the capital. Subsequently the Société Mutuelle Mobilière et Immobilière became interested in the affair, and it is these four groups which now control the Usines à Tubes de la Meuse.

Plant Covers 62 Acres

"The Usines à Tubes de la Meuse owns two plants, whose installations cover 62 acres. The plant at Sclessin manufactures butt welded tubing exclusively, while the main unit at Flémalle-Haute turns out seamless tubing and will shortly produce tubes of 300 to 1250 mm. (12 to 49 in. diameter) welded with water gas.

"The butt welding plant is decidedly the less interesting, and its processes do not differ greatly from those employed in America.

"The seamless tubing unit at Flémalle-Haute employs the Mannesman process and is equipped with Ackermann and Fasel machines. The Ackermann section comprises one roll mandrel mill and two Perrin tube rollers. The ingot of steel heated in an inclined furnace to 1200 deg. C. (2192 deg. Fahr.) passes through the roll mandrel mill, from which it emerges in the form of a rough cylinder.

"The rough cylinder then passes to one of the Perrin tube rollers, where a complicated process of rolling combined with acting of the mandrel draws out the steel into a long tube with walls of the desired thickness. From a cylinder of 1 m. a tube attaining 8 m. (26 ft.) may be produced. Tubes manufactured by the Ackermann section have any desired diameter from 76 to 216 mm. (3 to 8½ in.).

"The Fasel machines are employed in manufacture of small tubes and tubing of from 50 to 76 mm. diameter. The installations include an incline furnace for reheating steel bars, a boring mill operating along the principle of the Ackermann mill and a Fasel system

roller. The heated bar is seized by two disks in the boring mill, and, as it is drawn forward, a mandrel slowly bores the axial cavity. This semi-finished cylinder then passes to the Fasel roller containing seven pairs of rollers, four horizontal and three vertical, which press the tube tightly about the mandrel, drawing it out at the same time. A cylinder of one meter will give a tube of from six to eight meters, the thickness of the walls being regulated as desired. The motor power required for operation of these units is 360 to 600 hp. for the boring mill and 600 to 900 hp. for the Fasel roller.

"In connection with the Ackermann and Fasel units are joined other pieces of apparatus. Thus, two drawing plates with Galle chains of 50 and 100 hp. are used in manufacture of specially required diameters. The tubes treated are reheated in this process. A special separate rolling mill with decreasing passes functions for the production of similar grades. A reheating furnace, a steam hammer and three hydraulic proving machines complete the equipment.

"An important division of the Usines à Tubes de la Meuse is occupied with the cold drawing of tubes.

"In the finishing division of the Usines à Tubes de la Meuse production is finally adapted to the various needs of the clientele. Among products in which the company specializes may be mentioned:

- All forms of tubes employed in the petroleum industry, such as pipe-lines, lining tubes for wells, drill pipes, rotary boring tubes, etc.
- 2. Subterranean pipe channels for water and gas in semimild steel. This tubing is made of steel which best resists corrosion and is additionally prepared by baths in hot asphalt and by a spiral covering of tarred jute fabric. The tubing has been adopted by municipal administrations in Belgium and the Kongo.
- Tubes employed in the coal industry, such as air and evacuation tubes.
 - 4. Tubular poles used for tramway and telephone lines.
 - 5. Tubes for locomotives, automobiles, bicycles, etc.
- 6. Joints, attachments, and all other accessories used in connection with tubes and tubing.

"The new division for manufacture of welded tubes by use of water gas will soon constitute an important part of the Usines à Tubes, increasing the production by 700 tons per month.

Cooperative Selling Organization

"For purposes of sale of their products the Usines à Tubes de la Meuse has formed a cooperative organization with the French company d'Escaut et Meuse d'Anzin. As indicated above, the Belgian associate manufactures by far the larger part of Belgian production of tubes, while the Société d'Escaut et Meuse turns out over 50 per cent of the tubes produced in France. The strength of this cooperative organization is thus apparent. Moreover, the two associate companies have reached an agreement with the Rohrenverband and the Société des Usines à Tubes de la Sarre for sale of a considerable tonnage of seamless tubing in the United States over a period of three years. This tubing is destined for oil wells in California."

Cadmium Plating for Rust Resisting

Although it is generally believed that iron which has first been plated with copper and then with nickel will not rust when exposed in tropical and other humid countries, the Crosley Radio Corporation, Cincinnati, found as a result of extensive experiments in their research laboratories that metal so treated would rust. As they wanted to obtain a non-rusting iron armature for their musicones, it was necessary to do some experimenting. The result was the discovery that iron when plated with cadmium makes the piece so plated rust-proof regardless of climatic conditions. In addition to this non-rusting feature of cadmium plate the fact that cadmium has a low resistance makes it possible, it is added, to plate a much more even coat than can be done with nickel and other plating metals.

NEW TRADE PUBLICATIONS

Coal Handling Equipment—Freeman-Riff Co., Terre Haute, Ind. Folder showing use by Purdue University of handling, storing and weighing equipment for coal in a new power plant. The bunker capacity is 270 tons.

Recording Metera.—Esterline-Angus Co., Indianapolis. Folder describing a twin-type meter for producing two records on one chart, with synchronism as to time. Voltage and kilowatts or any other pair of records may be handled in this way. The charts are of size for going into letter file when folded twice.

Single-Pass Boiler.—Edge Moor Iron Co., Edge Moor, Del. Booklet describing a stationary boiler containing superheater and mechanical soot blowing equipment, all inclosed in a sectional air-tight casing. A boiler of this type was on exhibition Oct. 13 at the Binghamton (N. Y.) Light, Heat & Power Co. plant.

Mechanically Operated Flow Meter.—General Electric Co., Schenectady. Bulletin GEA-10 of 44 pages is devoted to meters for measuring fluids and gases. It is illustrated, carries price lists, tables of capacities, dimensions, clearances, etc., and indicating ranges of various charts used.

Rotary Positive Blowers.—Connersville Blower Co., Connersville, Ind. Bulletin 18-D shows blowers for rawwater ice systems. It is illustrated and has tables of capacities and pressures.

Motors.—Reliance Electric & Engineering Co., Cleveland. Bulletin No. 4000 covers ball and roller bearing motors for direct and alternating current. It is well illustrated, anti-friction bearings being given prominence. Tables of dimensions and clearances are shown.

Sigma Steel Fittings.—Walworth Mfg. Co., Boston. A distortion test of a flanged tee designed for 400 lb. working steam pressure is described in a leaflet of two pages.

Small Stoker.—L. S. Shaw & Co., 5716 Euclid Avenue, Cleveland. Folder devoted to the Thomas stoker for automatic firing of furnaces and boilers in residences, apartments and industrial plants. It is operated by a small water motor run by city pressure.

Underfeed Stokers.—American Engineering Co., Philadelphia. Catalog of 72 pages featuring the Taylor stoker as applied in power plant work. All new features of the stoker are brought out and many illustrations are given of its use, some diagrammatic, others installation pictures. Explanation is given of the operations and functions of the various parts of the stokers. The booklet shows the new stoker with a single feed ram per retort in place of the familiar two rams.

Motion and Operation Recorders.—Bristol Co., Waterbury, Conn. Catalog 1600 of 20 pages is devoted to recording instruments for making records of (mechanical) motion and of (electrical) operation. The former records the time of operation and the extent of mechanical movement on either round or strip charts. The second, operated electrically, records the effect and time of operation, as well as its duration.

Condulets.—Crouse-Hinds Co., Syracuse, N. Y. Descriptive folder and price list No. 2080 of tumbler switch condulets with watertight or guarded covers. Three types are featured—two-pole, three-way and three-pole.

Recording Pyrometers.—Brown Instrument Co., Philadelphia. New designs of recording pyromoters are shown in a 10-page pamphlet which gives samples of diagrams in colors. Several of the instruments shown are for the purpose of making more than one record, the maximum reaching six simultaneously.

Charging Plugs and Receptacles.—Albert & J. M. Anderson Mfg. Co., Boston. Bulletin 38 of 72 pages details a large variety of plugs and receptacles for electric connections, both for building and industrial use. Price lists are included, together with dimensioned drawings showing clearances.

Inductive Time Limit Controller.—Cutler-Hammer Mfg. Co., Milwaukee. Publication C-24 illustrates and describes a controller to meet the demand for time limit control, at the same time eliminating features such as dashpot and other mechanical means for securing the uniform period of acceleration. The booklet features various installations and shows the complete panel and the type of magnetic switches used in making up this controller.

Magnetic Clutches.—Cutler-Hammer Mfg. Co., Milwaukee. Publication P-11 illustrates and describes

many uses for magnetic clutches on synchronous motor drives where the starting is severe, such as in cement, flour, paper and steel mills. It contains working data and describes the principal features of the clutch, showing advantages of its use with standard synchronous motors.

Belted Synchronous Motors.—Electric Machinery Mfg. Co., Minneapolis. Bulletin 812 of eight pages is devoted to synchronous motors for belt or rope drive of machines. The lists include horse-powers from 5 to 1000, and speeds from 300 to 1200 r.p.m., with 60-cycle current. Operating voltages are listed from 220 to 4000.

Refractories.—Chicago Fire Brick Co., 111 West Washington Street, Chicago. Bulletin 1, Series B, entitled "Electric Furnace Brisket," describes a new bonding material.

Rotary Displacement Meter.—Connersville Blower Co., Connersville, Ind. Bulletin 4-C of 12 pages devoted to a gas meter originally used as a station meter in gas plants. It now is made for general service, in hourly ratings from 8000 to 700,000 cu. ft.

Water-Tube Boilers.—George T. Ladd Co., Pittsburgh. Catalog of 16 pages covering bent tube water-tube boilers of designs varying according to type of service. The catalog features the Dutch oven type, the high-arch type, the high-drum type, the multi-drum type in large units, the four-drum type, the waste-heat boiler and a pre-heater or integral economizer.

Multiple Spindle Automatics.—The Cleveland Automatic Machine Co., Cleveland. Booklet No. 9, illustrated, describes various features of the Cleveland multiple spindle automatic, and shows the various work which may be done on this machine.

Speed Reducers.—Foote Bros. Gear & Machine Co., Chicago, has published a revised edition of its speed reducer book. It consists of 80 pages, illustrated, and gives considerable new engineering information pertaining to the solution of problems involving spur and worm gear speed reducers. It is of interest to engineers and plant executives who have to deal with transmission gearing and speed reduction problems.

Roofing Tile.—Federal Cement Tile Co., Chicago. A four-page illustrated circular featuring the Chicago Union Station, which was roofed with Federal cement tile.

Automatic Change-Over Switch.—Westinghouse Electric & Mfg. Co. has issued leaflet L 20,234, describing an automatic change-over switch, designed to give continuity of service, and thus eliminate the serious losses occurring from the failure of voltage in such places as banks, hospitals, stores, laboratories, etc. The construction, application and distinctive features of the switch, which is essentially three-pole, double throw, full automatic oil circuit-breaker with a low-voltage release are outlined and illustrated.

Monel Metal and Nickel.—International Nickel Co., 67 Wall Street, New York. Buyers' guide, listing companies supplying mill and fabricated forms of monel metal and nickel. Pages 12, 8 by 11 in. A one-page supplement, designated as List B, lists technical and other literature published by the company.

Carbon Circuit Breakers.—Type CL carbon circuit breakers designed especially for 250-volt industrial applications where a compact breaker is required, are described in a new publication known as Circular 1705-A, recently issued by the Westinghouse Electric & Mfg. Co. The functions of the breaker contacts, its characteristics of effective shock absorption, adjustment and equalization of brush pressure, overload attachments and other points of interest in the carbon circuit breaker are covered.

Standard stock gears and allied products of the Charles Bond Co.. 617 Arch Street, Philadelphia, are listed in the company's catalog No. 42, recently published. Cut iron, steel, brass, Fabroil, rawhide and Textolite spur gears are included as well as cut steel racks and iron and brassinternal gears. Another section lists miter and bevel gears, worm gears and worms and helical gears. Allied products include sprocket and chain, silent chain drives, spur and worm gear reducers and ball and roller bearings. The use of each type of gear is outlined and rules for ordering given. The several pages devoted to tables and formulas include S.A.E. specifications for steel and for heat treatment. Illustrations and line drawings are large and clear, and the arrangement of the various sections and the large type facilitate reference and reading. The pages number 224, 5½ by 7½ in.

Bethlehem Properties and Growth

Properties and plants of the Bethlehem Steel Corporation are described pictorially in a 72-page brochure recently issued. The magnitude of the company's interests is impressed upon the reader on turning the pages. The plants are described briefly in order, beginning with the Bethlehem plant and running through the list to the shipbuilding and carbuilding plants. Two pages are taken up with illustrations of the orecarrying fleets, both on the lakes and on salt water. A graphic story of the growth of the company between 1905 and 1925 is given, the ingot capacity having been increased in 20 years from 190,000 tons per annum to 7,600,000 tons; the number of employees from 9500 to 70,000, and the value of properties from \$28,000,000 to \$450,000,000. The proportion of the properties devoted to commercial steel production has exactly reversed in the two decades, being now 92 per cent of the total against 8 per cent 20 years ago.

Patents and Trade-Marks

Two pamphlets have been issued by Richards & Geier, patent and trade-mark attorneys, 277 Broadway, New York, for the information of manufacturers and others, and are available to interested parties upon application. One of these relates to patents; law and practice, and is of 56 pages. This is the third edition of a brief treatise on the United States laws relating to patents, with considerable information in the last 20 pages on foreign patents, including charges, term of patents, and many other particulars. Questions of infringements, appeals, injunctions, searches, interferences, rights as between employer and employee, and many others are covered in the section devoted to the United States.

Trade-marks, trade names and unfair competition are dealt with in a 48-page pamphlet, of which the last third is occupied by information regarding foreign countries. This is the fourth edition of the trade-mark pamphlet, which covers definitions, piorities, valid and invalid marks, infringement and unfair competition, State and federal registration, interferences, appeals, infringements, etc.

Oil Burner Bulletin Published

A 28-page bulletin, covering methods and procedure in oil burner testing wherever the burners are fired under boilers or in warm air heating plants, has been issued by the American Oil Burner Association, 350 Madison Avenue, New York. The bulletin discusses such theoretical considerations as are needed for the practical application of the methods and procedure given, which apply for both industrial and domestic burners. One of the principal purposes of preparing the bulletin was to provide under one cover all the important tables and formulæ needed in testing burners, so that those in charge of the test need not suffer the usual annoyance and loss of time due to having to use a number of handbooks or references.

Tests of Riveted Joints

Comparative tests of button-head and countersunk riveted joints, made at the engineering experiment station, University of Wisconsin, Madison, are reported in a pamphlet issued by the University and priced at 15c. The report is made by Prof. J. B. Kommers and is based on tests of joints with single row of rivets for lap joints and single row on each side for single-covered butt joints. A second series covers lap joints with two and three rows of rivets and single and double-covered butt joints with one, two and three rows on each side.

General conclusions were that (1) either buttonhead or countersunk rivets may be used for riveted joints in which strength is the primary consideration; (2) where great rigidity is desired, button-head rivets should be used rather than countersunk; (3) because joints with countersunk rivets show high strength and considerable deformation, the indication is that,

for joints which may be subjected to impact or collision and in which a high capacity for the absorption of energy is desirable, countersunk rivets should be used rather than button-head.

Cables for Suspension Bridges

With particular reference to the construction of the Bear Mountain Bridge over the Hudson River near Peekskill, N. Y., the John A. Roebling's Sons Co., Trenton, N. J., has issued a splendidly illustrated brochure of 96 pages entitled "Construction of Parallel Wire Cables for Suspension Bridges." Description of the method of compacting the cables occupies a good portion of the work. Among the factors mentioned as important in designing cables of this type are the bending stresses due to changes in the cable curve, the permissible bearing pressure upon wires in saddles, the efficiency of strands containing a large number of wires, the efficiency of wires around strand shoes, etc. Each of these and a number of other points are discussed in considerable detail in the text portion of the work, several curves being used to illustrate the points brought out. More than half of the entire space, however, is occupied by photographic reproductions of suspension bridges, including many progress and detail photographs of the Bear Mountain Bridge.

Electric Wire and Cable

An unusual range of data on electric wire and cable is covered in a new loose-leaf catalog of more than 200 pages issued by the American Electrical Works, Phillipsdale, R. I. This is bound in limp leather and forms an attractive catalog of pocket size. Among the specialties covered are trolley wire of various descriptions, as well as all varieties of insulated and covered cable, magnet wire, telephone cable, etc. These various types are detailed in dimensions and electrical properties, while the general tables in the book are those customarily found in an engineering handbook.

Testing Heat Insulators

Investigation of certain methods for testing heat insulators forms the subject of Bulletin No. 33 of the Pennsylvania State College Engineering Experiment Station. The last half of the work consists of a voluminous bibliography on heat transmission, relating principally to insulating and building materials. Comparison of methods of testing was made in the thermal testing laboratory of the college. The work was done in a room maintained at constant temperature. The development of the methods covers work done during the past 15 years. Along with this development has been advancement in auxiliary equipment.

New Books Received

Principles of Industrial Organization. By Dexter S. Kimball. Pages 436, 6 x 9¼ in., illustrated. Published by McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, \$4.

Cost Accounting. By W. B. Lawrence. Pages 528, 6 x 9¼ in., illustrated. Published by Prentice-Hall, Inc., 70 Fifth Avenue, New York. Price, \$5.

Mineral Resources of the United States. 1922. Pages 648, 6 x 9¼ in., illustrated. Published by Department of the Interior, Washington, D. C.

Labor Relations in Industry. By Dwight Lowell Hoopingarner. Pages 542, 5% x 8½ in., illustrated. Published by A. W. Shaw Co., Cass, Huron and Erie Streets, Chicago. Price, \$6.

"Deutsches Export Adressbuch" is the title of a 240-page book of German industry engaged in the export business. It is published by C. Hofman & Co., Aarhus, Germany, and is indexed in German, Swedish, Danish and Polish. Articles are listed in classified order, a few small illustrations being used in a number of cases. It deals with materials of all descriptions. Iron and steel and hardware items are prominent.

The Bureau of Safety and Transverse Fissures in Rails

Washington, Dec. 15.—The Bureau of Safety, Interstate Commerce Commission, has in progress a comprehensive investigation concerning the chemical composition and structural state of steel rails with reference to the display of transverse fissures, and in this inquiry is working in cooperation with the steel mills and representative railroads. Announcement to this effect is made by W. P. Borland, director of the bureau, in his annual report for the fiscal year 1925. It says, in part:

"Steel rails superseded iron rails by reason of the increase in wheel loads. We passed from iron to steel, the best known material for resisting wheel loads, and are now confronted with the query whether steel, the substitute of iron, itself has not reached or nearly

reached its limit of endurance.

"Provided wheel pressures were greatly reduced, a stage would ultimately be reached when steel rails would endure the loads without rupture. The necessary reduction in wheel loads to insure immunity against rail fractures, in any known grade of steel, would hardly be tolerated in present railroad practice. The metallurgical problem is therefore to provide steel rails of such chemical or physical properties as will yield the greatest endurance to track conditions. To this problem the bureau is addressing itself, specifically to the matter of transverse fissures which constitute the most dangerous type of rail fractures."

Illinois Industries Report Increase in Employment

Since July, 31,500 persons have been added to the working forces of Illinois industries, an increase in the employed personnel of 4.2 per cent. November saw a continuance of the increase, with jobs for an additional 5000 persons. Heavy seasonal layoffs, which always come in November, were offset by expansion in other industries, so that the aggregate number of workers in profitable employment increased 0.7 per cent during the 30-day period. The average weekly earnings for the factory employees were \$28.46, just 3c. below the average for October, which was the peak for the last three years, according to the Illinois State Bureau of Industrial Accidents and Labor Research.

New High Record in Portland Cement

November production of Portland cement, reported by the Bureau of Mines at 13,639,000 bbl., brings the total for 11 months of the year to 150,472,000 bbl. This is higher than for the 12 months of any previous year—the new record made last year was 148,859,000 bbl. in the entire 12 months. If December this year shows the same production as December, 1924, the total will approach 161,000,000 bbl., or a gain of about 12,000,000 upon the previous high record.

Shipments in November were 10,169,000 bbl., and stocks at the end of the month aggregated 14,450,000 bbl. Total shipments for the 11 months aggregated 149,789,000 bbl., which is greater than the shipments for any previous entire year. It is very close to the production and, correspondingly, stocks at the end of November are very close to stocks at the end of 1924.

Steel Reinforcement Increases Life of Pavements

At a recent meeting of the Highway Research Board, National Research Council, in Washington, a report of an investigation as to the economic value of steel reinforcement in concrete roads was presented by C. A. Hogentogler. He said that the data collected by the board show that steel reinforcement reduced the rate of cracking in pavements and thereby increased the life of the roadway. This applies, he said, both to concrete pavements and to other pavements laid on a concrete base. Crack reduction, he added, is more eco-

nomically accomplished by the use of steel reinforcement than by additional thickness of concrete. Longer wear of pavements is the experience where small steel members are closely spaced as compared with large members more widely spaced. Increasing the weight of the steel from 25 to 56 lb. per 100 sq. ft. also considerably reduced cracking. A full report of the investigation may be had upon application to the National Research Council.

Brazil a Good Market for Industrial Machinery

That Brazil offers a good market for American industrial machinery is the conclusion of Assistant Trade Commissioner Cremer, Rio de Janeiro, in a lengthy report to the Department of Commerce, Washington. "Brazil now finds herself," he says, "in a position analogous to that of the United States just before the Civil War, needing highways, railroads and agricultural development. As a result there is an everincreasing demand for industrial machinery. . . . With her people inclined toward manufacturing, a government very favorable to industrial development, and a large market which should increase as individual purchasing power expands, Brazil offers opportunities which American manufacturers should not overlook."

Some of the unfavorable factors are stressed in the report, such as a depreciated exchange and the low purchasing power of the Brazilian people, but the trade commissioner's belief is that there will be a gradual

improvement in conditions.

British November Output Expands

London, England, Dec. 12 (By Cable).—The pig iron output in November was 494,100 gross tons, compared with 473,700 tons in October and 448,700 tons in September. The November steel production was 653,-800 tons, a moderate increase over the 647,100 tons made in October.

Comparative production figures for the British steel industry in gross tons per month are as follows:

1913, per month 855,000 639,000 1920, per month 669,500 755,600 1921, per month 217,600 302,100 1922, per month 408,300 486,000 1923, per month 619,800 707,400 1924, per month 609,900 685,100 January 1925 569,400 605,100 February 534,100 646,400 March 607,900 684,700 April 568,800 597,600 May 568,000 651,600 June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100 November 494,100 653,800		Pig Iron	Steel Ingots and Casings
1920, per month 669,500 755,600 1921, per month 217,600 302,100 1922, per month 408,300 486,000 1923, per month 619,800 707,400 1924, per month 609,900 685,100 January 1925 569,400 605,100 February 534,100 646,400 March 607,900 684,700 April 568,800 597,600 May 568,000 651,600 June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100	1913. per month	855,000	639.000
1921, per month. 217,600 302,100 1922, per month. 408,300 486,000 1923, per month. 619,800 707,400 1924, per month. 609,900 685,100 January. 1925 569,400 605,100 February 534,100 646,400 March 607,900 684,700 April 568,800 597,600 May 568,000 651,600 June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100			
1922, per month 408,300 486,000 1923, per month 619,800 707,400 1924, per month 609,900 635,100 January 1925 569,400 605,100 February 534,100 646,400 March 607,900 684,700 April 563,800 597,600 May 568,000 651,600 June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100	1921, per month		
1923, per month 619,800 707,400 1924, per month 609,900 685,100 January 1925 569,400 605,100 February 534,100 646,400 March 607,900 684,700 April 568,800 597,600 May 568,000 651,600 June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100			
1924, per month 609,900 685,100 January, 1925 569,400 605,100 February 534,100 646,400 March 607,900 684,700 April 569,800 597,600 May 568,000 651,600 June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100			
January, 1925 569,400 605,100 February 534,100 646,400 March 607,900 684,700 April 569,800 597,600 May 568,000 651,600 June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100			
February 534,100 646,400 March 607,900 684,700 April 569,800 597,600 May 568,000 651,600 June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100			605.100
March 607,900 684,700 April 569,800 597,600 May 568,000 651,600 June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100	February		
April 569,800 597,600 May 568,000 651,600 June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100			
May 568,000 651,600 June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100			
June 510,300 585,400 July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100			
July 492,700 590,400 August 444,500 477,100 September 448,700 638,900 October 473,700 647,100			
August 444,500 477,100 September 448,700 638,900 October 473,700 647,100		492,700	590.400
October	August		
October 473,700 647,100	September		
November 494,100 653,800	October		
	November		

Decline of British Brass Industry

The British brass trade, which is largely concentrated in the Birmingham (England) district, has been on the decline since the beginning of the war, according to Oscar F. Brown, United States vice-consul at Birmingham. This has been particularly the case in regard to the export trade, which in 1914 formed more than one-third of the total output, but has now sunk to less than one-sixth, it is said, because of the general decline in trade and the increased effectiveness of foreign competition. Domestic consumption has also declined somewhat on account of the general economic depression and more particularly because of the depression in the building trades, engineering and shipbuilding.

It has been estimated that the total output in the brass industry is about 20 per cent less than before the war, while profits have greatly decreased from the necessity of meeting foreign competition.

There is now, however, an inclination among those interested in the industry to believe that in the future conditions will improve gradually.

Machinery Markets and News of the Works

TOOL SALES DECLINE

But December May Rank Third or Fourth Best Month of Year

Norfolk & Western Railroad Places Orders Against Large List—Other Roads May Buy Soon

ALTHOUGH sales of machine tools this month will probably show a decline from the totals of October and November, a fair amount of business is being done and December may rank as the third or fourth best month of the year for machine tool manufacturers. Year-end watchfulness of expenditures on the part of industrial companies is credited as being the reason

for lessened activity in machine tool markets, but inquiries are in fairly good volume and point to an increase in orders after inventory season has passed.

Railroads are buying quite freely, the orders of the Norfolk & Western Railroad being the largest that have come from any single road in some weeks or months. The Louisville & Nashville has also purchased a number of tools recently.

Automobile and parts manufacturers continue to buy in small lots, but in the aggregate this business reaches a fairly good amount.

The New Zealand Government Railways are taking bids up to Jan. 15 on 22 motor-driven lathes and other tools. Some American manufacturers are hopeful of getting a part of this business.

New York

NEW YORK, Dec. 15.

ALTHOUGH the first half of December has brought a fair volume of machine tool business to local sellers, there are reports here and there indicating that the total sales this month may not reach the average of October and November. demand continues largely for special production machines, with general purpose tools lagging. The Norfolk & Western Railroad continues to place orders against its large list of requirements, issued a few months ago, and among the machines ordered within the week are a 90-in. locomotive axle journal turning lathe, a 50-in. vertical milling machine and a 27-in. x 16-ft. engine lathe. The Lehigh Valley Railroad has asked for revised quotations on a list of 10 or 12 tools sent out in August. The Wood Newspaper Machine Co., Plainfield, N. J., bought a 27-in, engine lathe from the Niles-Bement-Pond Co. and the Warren Foundry & Pipe Co., 11 Broadway, New York, bought from the same company a 36-in. x 26-ft. lathe. The Bryant Electric Co., Bridgeport, Conn., has bought a 13-in. geared-head

The machine which Dayton, Price & Co., Ltd., 420 Hudson Street, New York, is looking for is intended for the manufacture of riveted stove piping, a machine or machines for rolling, cutting, punching and riveting sheet iron.

The American Sugar Refining Co., 117 Wall Street, New York, has purchased three blocks of property in the vicinity of its refinery on South Second Street, Brooklyn, and plans the construction of additions. The present mill, which has been on a reduced basis for some time, will be entirely rebuilt and new machinery installed. The complete project will cost more than \$2,000,000 with equipment. Earl D. Babst is chairman of the board.

Serota Brothers, Inc., 1467 Utica Avenue, Brooklyn, is arranging for the erection of a two-story ice-manufacturing plant, 190 x 193 ft., to cost approximately \$150,000 with machinery. Ricca & Ungarleider, 186 Remsen Street, are architects.

The superintendent of light houses, Staten Island, N. Y., is asking bids until Dec. 21 for 6000 lb. of brass castings, proposal 20675.

The Fulton Tool Co., 702 Kent Avenue, Brooklyn, is said to be planning the installation of a power press and accessory

The Adirondack Feldspar Corporation, 119 State Street, Albany, N. Y., has taken over about 220 acres of Feldspar lands, with grinding mill and other property of the Maco Development Co., Wilton, Saratoga County, N. Y. The new owner plans extensive operations. W. B. Ewing is president; Simon Reynolds will be general superintendent at the plant.

The Packard Motor Car Co., Broadway and Sixty-first Street, New York, has leased a two-story building, 50 x 100 ft., to be erected at East Fordham Road and Belmont Avenue, for a branch service, repair and sales building. It will cost about \$100,000.

The Brooklyn Union Gas Co, 176 Remsen Street, Brooklyn, has plans for an artificial gas works on a 115-acre tract on Newtown Creek, Long Island City, to include a steam power plant, coal and coks-handling machinery, and byproducts works, to cost \$1,700,000. It is purposed to begin work in the spring.

The International Motor Co., 25 Broadway, New York, manufacturer of Mack motor trucks, has taken an option to purchase the plant of the Niles-Bement-Pond Co., Plainfield, N. J., adoining its works at that place. It is proposed to remodel the structures, installing equipment for parts manufacture, assembling service, etc. It is said that a portion of the plant will be used for the manufacture of gasoline railroad cars.

Adolph E. Nast, 56 West Forty-fifth Street, New York, architect, has plans for a two-story automobile service, repair and garage building, 100 x 100 ft., at 311-17 East Twenty-first Street, to cost approximately \$80,000.

The Union School District No. 5, Rhinebeck, N. Y., is considering the installation of manual training equipment in a proposed two-story high school to cost \$115,000, for which bids will be asked on a general contract early in next year. C. H. Gardinier, 46 North Pearl Street, Albany, N. Y., is architect.

The New Jersey & New York Wax Paper Co., East Rutherford, N. J., is planning for the establishment of a new plant to replace its works in a leased building, destroyed by fire Dec. 7, with loss estimated at \$30,000 including equipment.

The New Jersey Power & Light Co., Dover, N. J., has acquired the property of the Eastern Pennsylvania Power Co., Columbia, N. J., and plans improvements, including extension of the transmission system to the Delaware River opposite Easton, Pa., and additional power facilities. The company has also taken over the Boonton Gas Light & Improvement Co., Boonton, N. J., and the Raritan Valley Hydroelectric Co. The company is said to be concluding negotiations for the purchase of the Washington Gas Co., and proposes to modernze the local plant with the installation of new machinery.

The Board of Education, Little Falls, N. J., is considering the installation of manual training equipment in its proposed two-story high school, 130 x 195 ft., to cost \$175,000, for which bids will be asked on a general contract before the end of the month. Fanning & Shaw, 49 Ward Street, Paterson, N. J., are architects.

Louis Sachs, foot of Wilson Avenue, Newark, N. J., operating a grey iron foundry, has filed plans for a one-story addition to cost approximately \$14,000.

The J. A. Cozzone Co., 226 Sherman Avenue, Newark, manufacturer of fishing reels and other metal specialties, has leased a portion of the building at 18-30 Kent Street for a new plant and will take possession in January.

The Board of Education, Essex County Vocational Schools, 30½ Nelson Place, Newark, Robert O. Beebe, director, has rejected bids recently received for an addition to the vocational school at 294 Norfolk Street and purposes to ask new bids on revised plans in the near future.

Sears, Roebuck & Co., Arthington and Homan Avenues, Chicago, have filed plans for the initial building of their proposed plant at Port Newark, Newark, for the manufacture and distribution of portable houses, estimated to cost \$230,000. Other structures will be erected later.

The General Steel Casting & Machine Co., Inc., 8 Lister Avenue, Newark, has tentative plans for the rebuilding of its foundry recently destroyed by fire. Additional equipment will be installed. Garfield Kilpatrick is president.

The Specialty Handle Co., 121-3 New Jersey Railroad Avenue, Newark, will build a one-story addition.

The Sheffield Farms Co., Inc., 524 West Fifty-seventh Street, New York, contemplates the construction of a power house at its proposed two-unit milk pasteurizing plant on site, 200 x 660 ft., at Newark, N. J. The entire plant will cost \$1,500,000 with machinery.

The Board of Directors, Newark Technical School, 367 High Street, Newark, has tentative plans for a four-story school of engineering, 80 x 140 ft., in the rear of present buildings, to cost \$150,000. Allan R. Cullimore, director of the institution, prepared the plans. F. L. Eberhardt, president Gould & Eberhardt, Inc., machinist, is chairman of the building committee.

New England

BOSTON, Dec. 14.

A SLIGHT improvement in machine tool sales is noted by some local dealers. Sales the first half of December, however, were smaller than for any similar period in several months and the tendency is to reduce inventory as much as possible between now and Jan. 1. New England railroad shops are fairly busy. It is reported that New York interests which recently purchased the Bath Iron Works. Bath, Me., intend to dismantle the plant. Connecticut shops are, perhaps, the most active in New England, although some slowing up is noted. Rhode Island shops are doing fairly well, particularly those producing machinery.

The commissioner of ways and drainage, Lynn, Mass., is having plans prepared for a pumping station. Morris Knowles, 507 Westinghouse building, Lynn, is the engineer.

The city of Torrington, Conn., has under consideration the erection of a trade school on South Main Street, for which equipment will be required. The school department has the details. William E. Hunt, 187 Church Street, Torrington, is the architect.

The Rhode Island Fittings Co., Providence, R. I., has started foundations on Georgia and Allens Avenues for a one-story addition. Plans are private.

R. J. Simard, 24 Laighton Terrace, Lynn, is considering the erection of a machine shop on the Lynnway Aviation Field. Plans are private.

The New Departure Mfg. Co., Bristol, Conn., manufacturer of ball bearings, etc., has awarded a general contract to the Torrington Building Co, Torrington, Conn., for a one-story forge plant addition 25 x 218 ft.

The United States Gypsum Co., 205 West Monroe Street, Chicago, Ill., has acquired about 75 acres at North Canaan, Conn., comprising extensive lime deposits, and contemplates the construction of a new plant to cost more than \$150,000 with machinery.

The Foxboro Co., East Foxboro, Mass., manufacturer of measuring instruments and precision equipment, has plans under way for an addition for which bids will soon be asked on a general contract. Lockwood, Greene & Co., 24 Federal Street, Boston, are architects and engineers. E. H. Bristol is president.

The Bay State Furniture Co., Hyde Park, Boston, has plans for a one and two-story addition, to cost approximately \$50,000 with equipment.

The Hood Rubber Co., Watertown, Mass., manufacturer of automobile tires, etc., has awarded a general contract to the Aberthaw Construction Co., Boston, for two additions to cost \$200,000 with machinery.

Officials of the Holyoke Water Power Co., Holyoke, Mass, have formed the Holyoke Power & Electric Co., capitalized at \$1,000,000, empowered to operate in all parts of the State. The new company will take over the former organization and plans expansion, including hydroelectric power development on the Connecticut River. Additional steam-oper-

ated stations are also under advisement. Joseph A. Skinner is vice-president.

The Firestone-Apsley Rubber Co., Hudson, Mass., expects to ask bids in the spring for proposed additions, including improvements in the present mill, to cost \$500,000 with equipment. The company is operated by the Firestone Tire & Rubber Co., Akron, Ohio.

The Evarts Machine Co., 17 Francis Street, Hartford, Conn., has completed plans for a one-story addition, 35 x 55 ft., for which superstructure will soon begin.

George P. B. Alderman & Co., Alderman Building, Holyoke, Mass., architects, have begun the construction of a two-story automobile service, repair and garage building, 100 x 110 ft., to cost \$80,000 with equipment.

The Fall River Gas Works Co., 393 Madison Avenue, Fall River, Mass., has plans for a one-story machine repair shop, automobile service and garage building, 55 x 120 ft., to cost \$50,000 with equipment.

Landers, Frary & Clark, New Britain, Conn., manufacturers of electric heating and cooking apparatus, have awarded a general contract to the H. Wales Lines Co., Meriden, Conn., for an addition, 50 x 120 ft., to cost \$60,000.

J. F. Foster, 294 Washington Street, Boston, has been making inquiries for a 600 to 800-hp, crude oil engine-generator set, three-phase, 60-cycle, 550 or 2300 volts.

Philadelphia

PHILADELPHIA, Dec. 14.

WORK is under way on additions to the Lansdale, Pa., plant of the Abram Cox Stove Co., American and Dauphin Streets, Philadelphia, designed to house all departments. The Philadelphia works will be removed to this location and additional equipment provided for increased output. Offices and warehouse only will be maintained at Philadelphia in the future.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, will proceed with its proposed hydroelectric power project at Conowingo, Md., on the State line between Pennsylvania and Maryland. A power dam will be constructed across the Susquehanna River at this point and a power station built for seven generating units, each 43,000-hp. capacity. A steel tower transmission line will be constructed to Philadelphia and vicinity. The estimated cost is placed at \$52,000,000. W. H. Johnson is president.

The Duff-Nash Motor Co., 1113 South Broad Street, Philadelphia, local representative for the Nash automobile, is having plans completed for a three-story service, repair, garage and sales building, 80 x 100 ft., to cost \$140,000 with equipment. Philip S. Tyre, 114 South Fifteenth Street, is architect.

The Board of Education, Philadelphia, is said to be planning the installation of manual training equipment in its proposed three-story and basement high school at Fifty-third and Media Streets to cost \$1,020,000, for which plans have been filed. Irwin T. Catherine is architect for the board.

The American Sugar Refining Co., 117 Wall Street, New York, has work under way on a new steam power house at its Philadelphia mill, designed for the use of pulverized fuel. Later, it is purposed to convert the plant for fuel oil operation.

The Philadelphia Rubber Works, Inc., Land Title Building, Philadelphia, has asked bids on a general contract for a new one and two-story plant at Oaks, near Norristown, Pa., to cost about \$375,000 with machinery. A power house is planned. The Osborn Engineering Co., 7016 Euclid Avenue, Cleveland, is architect and engineer. J. K. Mitchell is president.

To carry out its project for a new plant at Emporium, Pa., the P. H. Fuller Co., 365 Gerard Avenue, New York, manufacturer of radio instruments, cabinets, etc., has organized a Pennsylvania company of like name capitalized at \$60,000. Guy S. Felt is treasurer. The works are expected to be ready for service at an early date.

The Atlantic Ice Co., Coatesville, Pa., is said to be planning the installation of cold storage equipment in its proposed two-story packing plant at West Chester, Pa., to cost \$35,000. F. P. Pennegar is president.

The Philadelphia Quartz Co., 121 South Third Street, Philadelphia, will ask bids early next year for its proposed one-story mill on site lately acquired on Geraldine Avenue, St. Louis, to cost \$250,000 with machinery. W. T. Elkinton is president.

The Andes Foundry Co., Lancaster, Pa., manufacturer of grey iron castings, etc., has awarded a general contract to Herman Wohlsen, Woolworth Building, for a one-story foundry addition, 50 x 155 ft., to cost \$28,000 with equipment. Eugene Andes is president.

The Crane Market

WHILE there is a fairly large volume of inquiry for WHILE there is a fairly large volume of inquiry for electric overhead and locomotive cranes, purchasing is delayed and a number of the current inquiries for cranes are expected to carry over into the new year. Among inquiries on which award is expected shortly are those of the New York, New Haven & Hartford Railroad for a 30-ton, 20-ton and two smaller overhead cranes and the two 7½-ton bucket handling cranes for Buffalo, asked for by the Hiler Engineering Co., Brooklyn, N. Y. The Phoenix Utility Co., 71 Broadway, New York, is asking for prices on a 10-ton, 18-ft. span hand power crane and has not yet Utility Co., 71 Broadway, New York, is asking for prices on a 10-ton, 18-ft. span hand power crane and has not yet closed on the 30-ton overhead crane for Ecuador. The Peerless Trading & Supply Co., 256 Johnson Avenue, Brooklyn, N. Y., is asking for prices on an electric traveling crane 30 to 35-ft. span for a client.

In the Pittsburgh district there has been slightly more activity with the Carnegie Steel Co. and the Youngstown

Sheet & Tube Co. among recent buyers. The latter 11 cranes between the Morgan Engineering Co. and Alliance Machine Co.

Among recent purchases are:

Nevada Consolidated Copper Co., 25 Broad Street, New York, two 5-ton electric traveling cranes from the Northern Engineering Works.

Frick Co., Waynesboro, Pa., a 10-ton, 28-ft. 9-in. span overhead crane from the Niles-Bement-Pond Co.

Norfolk & Western Railroad, Roanoke, Va., a 10-ton.

110-ft. span overhead crane from the Niles-Bement-Pond Co.

Youngstown Sheet & Tube Co., Youngstown, nine over-ead cranes from the Morgan Engineering Co. and two from the Alliance Machine Co.

Carnegie Steel Co., Pittsburgh, two 25-ton, 70-ft. 6-in. span, 4-motor magnet handling cranes for Duquesne, Pa., from the Alliance Machine Co.

Midland Steel Products Co., Cleveland, a 5-ton, 67-ft. span overhead crane from the Northern Engineering Works.

United States Aluminum Co., Arnold, Pa., a 71/2-ton, 76-ft. span overhead crane from the Northern Engineering Works.

John Deere Harvester Co., East Moline, Ill., a 5-ton, 76-ft. 8-in. span, 3-motor overhead crane, through Page & Ludwick, Chicago, from the Milwaukee Electric Crane & Mfg. Co.

James J. McFeely, Hoboken, N. J., a 25-ton locomotive crane from the Browning Crane Co.

Newark Sand Co., Newark, N. J., a 25-ton used Browning locomotive crane from the Hoisting Machinery Co., 50 Church Street, New York.

Detroit, a 30-ton locomotive crane Lennane Brothers, from the American Hoist & Derrick Co.

American Gas & Electric Co., New York, a 25-ton over-head crane for Pittston, Pa., from the Whiting Corporation.

The Jenkins Township School District, Main Street, Port Blanchard, Pa., William H. Muir, secretary, is considering the installation of manual training equipment in its proposed two-story and basement high school near Pittston. st \$115,000. Ralph M. Herr, Simon Long Building, Wilkes-Barre, Pa., is architect.

Plans of the Ford Motor Co., Detroit, for its assembly building on the site of the former works of the Merchant Shipbuilding Co. at Chester, Pa., purchased last spring, have been changed and call for the erection of a main structure, 285 x 1130 ft. to cost about \$2,000,000. The bulkhead and dock line on the Delaware River will be extended which will add between two and three acres to the 50-acre tract and will permit the direct exportation of the assembled machines. Original specifications were for a building 455 x 855 ft. to cost \$1,500,000.

The Bonney Forge & Tool Works, Allentown, Pa., manufacturer of chrome vanadium drop-forged wrenches, has broken ground for an addition, 110 x 200 ft., to accommodate its increased business. Operations are expected to begin in

South Atlantic States

BALTIMORE, Dec. 14.

BOND issue of \$2,250,000 is being sold by the Potomac A Edison Co., Cumberland, Md., a considerable portion of the proceeds to be used for extensions and improvements in power plants and system. M. F. Riley is president.

The Pyrograph Advertising Sign Corporation, Baltimore, has leased a building at Eastern Avenue and Thirty-seventh Street, and will install equipment for the manu-facture of glass advertising signs under a special process

Elevating, conveying and other material-handling ma chinery will be installed in the four-story warehouse and distributing plant to be erected by the J. W. Crook Stores Co., 415 Guilford Avenue, Baltimore, to cost \$500,000. James W. Crook is president.

Fire, Dec. 10, destroyed the plant of the Southern Fertilizer & Chemical Co., Hutchinson Island, Savannah, Ga., with loss reported at \$800,000 including machinery. Plans are under consideration for rebuilding.

The Southern Engineering & Operating Co., Atlanta, Ga., is arranging for the erection of a one-story ice-manufacturing plant at 800 East Fair Street, to cost \$30,000 with

The Maryland Lumber & Millwork Co., Madison Avenue and Washington Street, Hagerstown, Md., has plans for an addition to its mill to cost about \$28,000 with equipment. William A. Danzer is president.

The Cannon Mfg. Co., Kannapolis, N. C., is planning the construction of a power house in connection with proposed additions to its local cotton mills. The entire project will close to \$2,000,000.

The R. S. Armstrong & Brother Co., Atlanta, Ga., machinery dealer, has inquiries out for a 20-ton derrick, with or without hoists.

The Maryland Glass Corporation, Mount Winans, Md., has awarded contract to the Consolidated Engineering Corporation, Calvert Building, for an addition, for which foun-dations will soon be laid. Headquarters are in the Bromo Seltzer Tower Building, Baltimore.

C. Walker Hodges, Morehead City, N. C., is desirous of getting in touch with manufacturers of iron and steel gearing, both cut and cast teeth, including worm gears.

The Asheville Supply & Foundry Co., Eagle Street, Ashe-The Asheville Supply & Foundry Co., Eagle Street, Asheville, N. C., has purchased two acres in the Biltmore district and contemplates the early erection of a new plant, consisting of a fabricating shop, 30 x 190 ft.; foundry for iron castings, 60 x 80 ft.; foundry for brass and bronze castings, 31 x 36 ft.; forge shop, 40 x 51 ft.; machine shop, 50 x 100 ft.; welding shop, 21 x 26 ft.; pipe and fittings shop, 50 x 80 ft.; car repair shop, 30 x 50 ft.; storage buildings, etc.; estimated to cost \$200,000 with equipment. D. S. Hildebrand is president. Hildebrand is president.

The Pulaski Foundry & Mig. Co., Pulaski, Va., is said be planning the purchase of an air compressor and other equipment.

The Virginia Electric & Power Co., Richmond, Va., negotiating for the purchase of the municipal power plant at Elizabeth City, N. C., and plans the installation of additional equipment.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for a two-line clam-shell bucket, about 1½-yd. capacity, for handling broken stone; an enginedriven mechanical fan for forced draft for under-feed stokers used with 1500-hp. boiler capacity; two boiler feed pumps for use in connection with 1500-hp. boiler capacity; two 500-hp. p. watertube boilers, to operate at 200 lb. pr soot blower, superheaters, etc.; one 750-hp. pressure, type feed water heater; one electric generator, belted-type, 750 to 1000 kw. rating; quantity of pipe and fittings, and self-supporting steel stack, suitable for 1500-hp. boiler capacity.

Sears, Roebuck & Co., Chicago, have tentative plans for a nine-story storage and distributing plant, and factory branch at Atlanta, Ga., with power house, estimated to cost \$3,000,000 with equipment. C. M. Kittle is president. estimated to

The Thomasville Bedding Co., Thomasville, N. C., recently organized, has purchased a site on Taylor Avenue, and plans the construction of a two-story factory, 50 x 125 ft., for the manufacture of bedsteads, etc., to cost \$45,000 ith machinery. George Lamberth and J. R. Myers, both of Thomasville, head the company.

The Central Oil Co., Pomona, N. C., is planning the construction of a new storage and distributing plant on West Lee Street, Greensboro, N. C., to cost \$70,000 with equipment. P. McLaird is president.

The Public Service Co., Greensboro, N. C., is reported planning extensions and improvements to cost about \$75,000, including the installation of high pressure gas equipment, and kindred apparatus.

The S. M. Parker Lumber Co., Cordesville, S. C., Is completing plans for rebuilding the portion of its local mill,

barrel and cooperage works, and saw mill, recently destroyed by fire with loss of \$200,000 including machinery.

The Liddell Co., North Church Street, Charlotte, N. C. manufacturer of cotton-ginning machinery and auxiliary equipment, plans extensions and the installation of addi-tional equipment. J. T. Beatty is general manager.

Harry W. Belfor, 116 Vedado Way, Atlanta, Ga., has inquiries out for wood-working machinery for the manufacture of windows, doors, etc. Planing mill equipment will also be installed.

The Liberty Auto Supply Co., Berkley, Va., contemplates rebuilding the portion of its plant recently destroyed by fire with loss of about \$30,000 including equipment.

Chicago

CHICAGO, Dec. 14.

BUYING of machine tools is less active, although inquiries are fairly well maintained. In the absence of outstanding lists, interest in the market is restricted to a wide diversity of users who want one or two tools. Nineteen twenty-five will prove a better year for local dealers than 1924. September, October and November were the best months in business booked, although the first three months of the year were good.

Used machinery is finding a ready market at this time, punch presses being in the greatest demand. Deliveries have not changed materially, still ranging from 60 days to four months. price changes are reported. Local dealers found little to interest them at the recent auction sale of the equipment of the Earl Motors, Inc., Jackson, Mich.

The International Harvester Co., Chicago, has purchas a number of used tools for its various plants. The Durabilt Steel Locker Co., Rockford, Ill., has bought a 24-in. shaper and the Ladish Drop Forge Co., Milwaukee, placed a large die sinking machine. The Studebaker Corporation, South Bend, Ind., closed for two tool and cutter grinders, a manufacturing lathe and several automatics. The Nash Motors Co., Kenosha, Wis., placed a special horizontal boring mill and several pieces of tool room equipment. The Caterpillar Tractor Co., Peoria, III, has purchased a large broaching machine and the Yellow Coach & Truck Mfg. Co., Chicago, bought a 20-in. shaper, a 16-in. x 8-ft. lathe and an 18-in. x 8 ft. lathe. An Indiana piston ring maker has ordered an 18-in, x 7-ft. lathe. Users actively interested in tools include the Chicago, Milwaukee & St Paul, which is taking prices on a rail drill; the Allis Chalmers Mfg. Co., Milwaukee; the Hannum Mfg. Co., Milwaukee, and the Insley Mfg. Co., Indianapolis.

Orders received by the Pratt & Whitney Co. include two 16-in, geared-head lathes from the Remy Electric Division, General Motors Corporation, Anderson, Ind.; two 13-in. geared-head lathes from the Bassick Mfg. Co., Chicago 14-in, vertical surface grinder from the International Har-vester Co., Chicago, and a die sinking machine from the Chicago, and a die sinking machine from the Rockford Drop Forge Co., Rockford, Ill.

The Grand Trunk Western Railroad Co., Detroit, will build a one-story round-house, 77 x 17 ft., at Forty-ninth Street and Kedzie Avenue, Chicago, to cost \$12,000.

Rega & Weiner, 1330 West North Avenue, Chicago, are having plans prepared for a one-story automobile body factory, 75 x 125 ft., at the corner of West North and Marshfield Avenues, Chicago. Plans are being drawn by Harry Dalfey, 2321 West North Avenue. The cost is estimated at \$45,000.

The Crawford Iron Works, 4400 Grenshaw Street, Chicago, will build an addition, 50 x 100 ft., to cost \$30,000.

A. L. Himelblau, 30 North Dearborn Street, Chicago, is the architect.

Drying Systems, Inc., manufacturer of air condensing de vices. South Desplaines Street, Chicago, has acquired from the Great Lakes Wall Paper Mill the two story building at the corner of Balmoral Avenue and West Ravenswood Park, 125 x 250 ft., for \$80,000.

The Blackhawk Foundry & Machine Co., Davenport, Iowa, will erect a foundry addition, 100 x 110 ft. Walter Voss is

The Maremont Mig. Co. 916 Wabash Avenue, Chicago, manufacturer of automobile bodies, has asked bids on a general contract for a new two-story plant on Ashland Avenue, to cost approximately \$200,000 with machinery. Halperin & Braun, Chicago, are architects.

Swift & Co., Inc., Stock Yards, Sioux City, Iowa, has awarded a contract to Coomer & Small, U. B Building, for rebuilding its three-story fertilizer plant recently partially

destroyed by fire. It will cost about \$30,000. Frank Gale is manager.

The Northern States Power Co.; Minneapolis, Minn., disposing of a bond issue of \$8,500,000, a portion of the proceeds to be used for extensions and improvements in power plants and system, and the acquisition of other properties. J. J. O'Brien is president.

The Clamp Nail Co., 4532 Palmer Street, Chicago, has awarded a general contract to Enger Brothers, 4910 St. Paul Street, for its one-story addition, 66 x 67 ft., to cost about \$21,000. G. E. Pearson, 1930 Keystone Avenue, is architect.

The Pence Auto Co., 800 Hennepin Avenue, Minneapolis, Minn., will soon ask bids for a two-story machine repair shop, service and garage building at Mitchell, S. D., to cost \$75,000. Long & Thorshov, Andrus Building, Minneapolis, are architects. H. E. Pence is president.

The Northwestern Public Service Co., Iroquois, S. D., s plans under way for extensions and improvements in local electric power house, including the installation of additional equipment.

The Illinois Nail Co., 826 Dix Street, Chicago, awarded a general contract for a one and two-story build-ing, 100 x 160 ft., primarily for warehouse and distributing service. It will cost approximately \$50,000. Paul Gehrhart, 64 West Randolph Street, is architect. J. B. Sherlock is

The Commonwealth Edison Co., 72 West Adams Street, Chicago, has plans for the first unit of a new U-shaped service, repair and storage plant at West Twenty-second and Throop Streets, 240 x 928 ft., to cost \$900,000 with equipment. Departments will be installed for meter parts manufacture, assembling and other precision work. Considerable material-handling machinery will be installed. Samuel Insull is president.

The Board of Education, La Salle, Ill., plans the installation of manual training equipment in its proposed three-story and basement high school, to cost \$600,000. Childs & Smith, 720 North Michigan Avenue, Chicago, are

The Minnesota Power & Light Co., Duluth, Minn., make enlargements and improvements in its power plant at Virginia, Minn., and install additional equipment.

Buffalo

NONTRACT has been let by the Carborundum Co., Buf-ONTRACT has been by the following of the

The Buffalo Body Corporation, 824 Seneca Street, Buffalo, is contemplating rebuilding the portion of its plant on Smith Street, destroyed by fire Dec. 5 with loss of \$150,000 including equipment.

Ihde Brothers, 18 Colorado Avenue, Buffalo, manufacturers of cast concrete blocks and kindred products, have acquired 2 acres, heretofore held by the Howard Steel Corporation and contemplate the early erection of a new

The Bayless Pulp & Paper Co., Binghamton, is interested in a new company which plans the construction of a sulphite pulp and newsprint mill at Beaupre, near Quebec, heretofore held by the Bayless organization. The project is reported to cost more than \$1,500,000. Franklin Bayless is president.

The New York State Gas & Electric Corporation, Ithaca, Y., will take over and consolidate 10 electric light and power utilities operating in Delaware, Sullivan and other counties and will make extensions and improvements in power plants and transmission lines.

The Buffalo Spring Co., 146 Virginia Street, Buffalo, is considering preliminary plans for the rebuilding of the portion of its factory recently destroyed by fire. Earl Plantz

The Mount Morris Valve Corporation, Mount Morris, N. Y., recently organized, is beginning superstructure for its proposed one-story plant, 45 x 190 ft., and plans to have the building ready for machinery early in January. Lawrence Bellinger is president.

The Rome Metallic Bedstead Co., Anabel Avenue, Long Island City, N. Y., has leased space in the building at Chicago and Scott Streets, Buffalo, totaling 15,000 sq. ft., a factory branch.

The Board of Education, Scottsville, N. Y., is considering the installation of manual training equipment in its proposed two-story high school, to cost \$200,000. C. Ade, proposed two-story high school, to cost \$200,000. C. Ade, 104 East Avenue, Rochester, N. Y., is architect.
Turner & Porter, Inc., printer and engraver, 49 West Swan Street, Buffalo, is reported in the market for electrical

power and other equipment to replace that recently destroyed by fire.

Fire, Dec. 6, destroyed a portion of the plant, machinery and equipment of the Erie Lithographing Co., Inc., Erie, Pa., with loss of \$85,000. Plans for rebuilding are said to be under consideration and include a one-story

The Todd Co., Inc., University Avenue, Rochester, N. Y., manufacturer of check protectors and equipment, has work under way on a one-story addition, 50 x 120 ft., of brick and steel. The H. K. Ferguson Co., Cleveland, is engineer

Ohio

CINCINNATI, Dec. 14.

WHILE machine tool sales in Cincinnati have fallen off somewhat the fallen off somewhat the past week, buying continues on a liberal scale and December will probably rank as the third or fourth best month of the year in the total volume of new business. Manufacturers in the Detroit district have again been active purchasers of equipment, and railroads are attracting renewed interest because of the large number of tools which they are now buying or which thy expect to order within the next two months. Although the electrical industry has confined its recent transactions to single machines, machine tool manufacturers believe that business from that source will mount to high figures the coming year.

In Cleveland machine tool business is still coming out in fair volume but sales show a falling off as compared with November. Orders placed during the week were almost entirely in single machines from diversified industries. Some prospe tive business is being held until after the first of the year. Sales in the Detroit territory have fallen off considerably and, in the opinion of the trade, buying by the automotive industry for its large expansion and replacement program is about over. The Ohio Brass Co., Mansfield, Ohio, has purchased a 13-in. Pratt & Whitney lathe. The Chrysler Motor Corporation has bought a Pratt & Whitney 16-in. geared-head lathe. Used machinery is holding in good volume.

Inquiries for machine tools in the Cincinnati market indicate that considerable equipment will be ordered in January and February. Several important firms in the general industrial field are expected to expand manufacturing facilities and will necessarily be in the market for machinery. Despite the decrease in sales, production in Cincinnati machine tool plants will go forward at the present rate throughout December and January and possibly longer.

The Norfolk & Western bought the following equipment from the Niles-Bement-Pond Co.: A 27-in. x 16-ft. lathe, 50-in. vertical milling machine, 36-in. x 14-ft. planer and a 90-in. quartering machine. It also purchased a switch planer from a local builder. The Cincinnati Planer Co. booked a 30-in. motor-driven planer for shipment to Alabama and a 42-in. machine for delivery to an Indiana company. Outstanding among the week's orders was a number of spemachines to be supplied to the Ford Motor Co. by local builder.

The New Zealand Government Railways, Wellington, New Zealand, will take bids until Jan. 15 on 22 motor-driven lathes, including tool-room, portable and engine lathes, and a number of other tools. The Oakland Motor Car Co. purchased two rotary millers and is expected to close the coming week for several lathes. The Nash Motors Co., Kenosha, Wis., and the Hercules Corporation, Evansville, and the property two lathes from a local builder. The Kenosha, Wis., and the Hercules Corporation, Evansville, Ind., each bought two lathes from a local builder. The John Steptoe Co. sold a milling machine to a Louisville concern and a 20-in. x 10-ft. lathe for shipment to Hawaii. The A. O. Smith Corporation, Milwaukee, has taken two large lathes, and a Cincinnati machine tool manufacturer has an order for a lathe from the Argentine navy.

A Springfield, Ohio, company closed for a Pratt & Whitney vertical shaper, while an Evansville, Ind., firm bought a 10-in. thread miller. A local builder sold a radial drill in Chicago and a similar machine to an Eastern machine tool company. The General Electric Co., Schenectady, N. Y., purchased a 36-in. vertical drill from the Niles-Bement-Pond Co. The latter company booked two 32-in. vertical drills from the Union Tank Car Co., New York, a multi-driven dry grinder from the American Cast Iron Pipe Co., Birmingham, and a 73-in. boring mill for the Louisville & Nashville Railroad. A Michigan foundry bought two rotary milling machines locally.

The New York Central Railroad is reported to be in the market for a 24-in. axle journal turning lathe and several drills. A local turret lathe manufacturer booked a moderate number of single machines from widely scattered sources. A Cincinnati used machinery dealer received an order to equip a machine shop in North Carolina with 14 tools valued at approximately \$17,000.

The City Council, Columbus, Ohio, is contemplating the of a boiler and the erection of substations in with the municipal electric light plant at a purchase of a connection cost of \$197,000.

Maxwell Howard. Dayton, Ohio, has purchased paper mills at Franklin, Ohio, which will be remodeled and equipped with new machinery. The mills will be operated as the Maxwell Paper Co.

The Cincinnati Mfg. Co., 1900 Gest Street, Cincinnati, manufacturer of architectural iron, brass and other metals products, is having plans drawn for a five-story addition, 75×100 ft., to cost \$100,000 with equipment. A. H. Shoenberger is president.

The W. M. Ritter Lumber Co., Columbus, Ohio, has acquired the mills and property of the C. Crane Co., in the vicinity of Barrett, W. Va., and plans enlargements and the installation of saw mill machinery and other equipment, to cost \$200,000.

The Bishopric Mfg. Co., Spring Grove and Estes Avenues, Cincinnati, manufacturer of wallboard products, has awarded a general contract to the Ferro Concrete Construction Co., local, for a two and three-story addition, 60 x 120 ft., to cost about \$60,000. Benjamin De Camp, Corke Building in architect. Alliann Bishopric is presented. Gerke Building, is architect. Allison Bishopric

McGregor Mfg. Co., 1013 Chestnut Street, Chattanooga, Tenn., has leased a building and will estab-lish a plant for the manufacture of hardware products, acetylene generating equipment, etc., F. W. Schurene is general manager.

The National Baking Co., Columbus, Ohio, operating the Donaldson Baking Co., Columbus, and other subsidiaries, is disposing of a preferred stock issue of \$900,000, the proceeds to be used for the construction of two new plants at Cincinnati and Dayton, respectively, to include the installation of ovens, power equipment, conveying machinery and other equipment.

The Kentucky Hydro Electric Co., Louisville, is disposing of a preferred stock issue of \$465,000, a portion of the fund to be used for extensions and improvements in-power plant and system. The company is operated by the Middle West Utilities Co., 72 West Adams Street, Chicago.

The Dempster Construction Co., and the Dempster uipment Co., both 712 Walnut Street, Knoxville, Tenn., Equipment Co., affiliated organizations, will proceed with the construction of a one-story locomotive repair shop on a 6-acre tract recently acquired. The initial structure will cost in excess \$70,000 with equipment. Other buildings will be erected later.

The Board of Education, Smithfield, Ohio, is said to be planning the installation of manual training equipment in its proposed two-story and basement high school, to cost \$100,000. J. Kerr, Griffin Street, Clairsville, Ohio, is architect.

The Eastern Machinery Co., 408 East Pearl Street, Cincinnati, has inquiries out for a 100-ton hydraulic press, and other presses similar to Bliss model No. 210,

Fire recently destroyed the major portion of the brick and tile manufacturing plant of the William E. Dee Co., Oak Hill, Ohio, with a loss of \$270,000. Plans for rebuilding are under advisement. Headquarters of the company are at Chicago.

Milwaukee

MILWAUKEE, Dec. 14.

NEW business in the local machine-tool market is beginning to show a slackening of interest at the approach of the holiday season. While tool builders are busy on bookings, inquiry has fallen off and sales have slowed up, many customers being engaged in or preparing to take inventory. The trade considers the situation considerably more favorable than at the close of last year, and the out-look for the early months of 1926 good. At the beginning of December the total number of ployees in 47 typical shops in Milwaukee was 34,835, compared with 34,784 on Nov. 1. This is the highest of the year and represents a gain of more than 5000 in 11 months.

The Pelton Steel Casting Co., Milwaukee, has been incorporated in Wisconsin with an authorized capitalization of

\$50,000 to take over and continue the operation of the Pelton Steel Co., division of the Stowell Co., South Milwaukee. property includes a steel foundry, pattern shop and auxiliary buildings, with seven acres at Chicago Road and Elliott Place. Arthur J. Ehne, president and treasurer John Ehne & Sons, pattern works, 245-251 Lake Street, Milwaukee, is president of the new Pelton company. Harlow A. Leekley, who has been works manager of the plant, and T. W. Ward are vice-presidents, and Allen M. Schlichter, secretary. Mr. Ehne also is treasurer. Approximately 100 men are now employed, and it is intended to effect a 30 to 50 per cent increase in capacity immediately.

The Blatz-Page Co., Milwaukee, has been incorporated The Blatz-Page Co., Milwaukee, has been incorporated in Delaware with \$300,000 capital stock to conduct the business formerly carried on by the Standard Separator Co., Forty-fifth Avenue and Burnham Street, West Allis, Milwaukee. The principal products are cream separators, milking machines, gas engines and other dairy equipment and machinery. Albert Blatz, Jr., who has been managing the Standard property for some time past, has been elected president of the new company. C. K. Davis, of Chicago, is secretary.

The Red Star Yeast & Products Co., 79 Buffalo Street, Milwaukee, has engaged Cahill & Douglas, consulting engineers, 217 West Water Street, local, to design and supervise the construction and equipment of an addition to the steam generating plant of its main works which is part of a \$75,000 plant enlargement project. The architect is Eugene R. Liebert, 49 Oneida Street, Milwaukee.

The Dundas Mfg. Co., of Dundas, Wis., has been incorporated with \$50,000 capital stock to manufacture can washers and other machinery and appliances for canning factories. The principals are Michael Brooks, Robert D. Baker and Joseph Wolfingen, who has been manufacturing gasoline tractors and engines for many years. The new operation will be conducted in the engine works, which are to be enlarged.

George W. Boller, 370 Brady Street, Milwaukee, let the general contract to the R. L. Reisinger Co., 454 Oakland Avenue, local, for the construction of a \$100,000 garage and service building, 120 x 143 ft., at 284-288 Farwell Avenue.

The Wisconsin Public Service Co., Green Bay, Wis., will the Wisconsin Fubic Service Co., Green Bay, Wis., Win build a new steam-operated electric power plant to cost \$1,500,000 with transmission lines. The company is oper-ated by the Byllesby Engineering & Management Corpora-tion, 208 South LaSalle Street, Chicago.

Gulf States

BIRMINGHAM, Dec. 14.

PRELIMINARY plans are under way by the Ocala Portland Cement Co., Ocala, Fla., for the construction of a new mill to cost \$650,000 with machinery. The project includes a power house and machine shop. The company was organized recently and is headed by F. H. Logan and Joseph Bell, both of Ocala.

T. H. Newman, 324 S. W. Sixteenth Street, Miami, Fla., and associates will build a two-story ice-manufacturing plant at 2604 S. W. Seventeenth Street, 56 x 125 ft., to cost \$100,000 with machinery.

The West Coast Fertilizer Co., Tampa, Fla., has pre-liminary plans for rebuilding the portion of its local mill, recently destroyed by fire with loss of \$200,000 including machinery.

The Florida Power & Light Co., Miami, acquired property on the New River, near Fort Lauderdale, Fla., and plans the early construction of a steam-operated Fla., and plans the early construction of a steam-operated electric power plant with initial capacity of 50,000 kw. A transmission system will be built. The project will cost close to \$700,000. The company has work under way on a similar plant on the St. Johns River, near Sanford, Fla., with a first unit of 10,000 kw. rating to be ready for service late in 1926; shortly thereafter, a second unit of like capacity will be installed, while the complete plant will have an output of 100,000 kw.

John K. Spaulding, Fullerton, La., machinery dealer, has inquiries out for a belt-driven air compressor to deliver 100 lb. pressure.

The Continental Wirebound Box Co., 2324 Maury Street, Houston, Tex., will begin superstructure for a one-story addition, 105 x 120 ft., to cost approximately \$20,000, for which a general contract has been awarded to Henry H. Yates, 1213 Wrightwood Street. S. F. Talbert is president.

The Palestine Ice Co., Palestine, Tex., will rebuild the portion of its ice-manufacturing plant destroyed by fire

portion of its ice-manufacturing plant destroyed by fire Dec. 6, with loss estimated at \$70,000 including machinery. W. B. McNaughton heads the company.

The Duntile Builders & Supply Co., Stuart, Fla., has inquiries out for a rock crusher. It will also purchase a pump for handling sand.

The Hardwicke-Etter Co., Sherman, Tex., manufacturer of cotton ginning machinery and parts, has begun the erection of a one-story addition, 125 x 150 ft., to cost \$25,000. A portion of the structure will be used for assembling.

The Pensacola Shipbuilding & Engineering Corporation, Pensacola, Fla., recently organized by E. M. Elliott, Pensacola, and associates, has plans under consideration for a shipbuilding and repair works to cost close to \$250,000 with machinery.

The Tutt Ice Mfg. Co., Meridian, Miss., will begin the construction of a one-story plant to cost about \$40,000 with equipment.

The South Baldwin Brick Corporation, Foley, Ala., will and lime brick manufacturing plant at Oak, Ala., to cost \$30,000.

The Galveston Electric Co., Galveston, Tex., operated by Stone & Webster, Inc., 147 Milk Street, Boston, has closed negotiations for the purchase of the plant and system of the Brush Electric Co., operating in the same city, controlled by the Cities Service Power & Light Co., 60 Wall Street, New York. The new owner will consolidate the property, and plans extensions and the installation of additional equipment.

The Alexandria Ice & Cold Storage Co., Alexandria, La. arranging for a new ice-manufacturing plant with initial daily capacity of 125 tons. The work will include extensions and betterments in two existing ice plants, with additional equipment. A fund of \$250,000 has been arranged. George E. Wells, Security Building, St. Louis, is consulting engineer. Edwin Harding is president.

The Hattiesburg Flooring Co., Hattiesburg, Miss., rently organized, has acquired the local mill of the Aladdin Co., Bay City, Mich., manufacturer of portable houses, on West Fourth Street. The new owner will remodel and install additional equipment. Horace G. Roberts heads the company.

The Gamble-Stockton Co., Jacksonville, Fla., has in progress on a new brick-manufacturing plant at Dixston, Fla. It will be equipped for an initial capacity of 75,000 brick per day, with installation including 9 kilns, to be increased later to 27. It will also develop clay properties in this section. Robert Gamble is vice-president; and C. W. Dixon, vice-president and general manager.

The Board of Education, Pine Hill, Ala., will rebuild the portion of its vocational school recently destroyed by fire. New machinery will be installed to replace damaged apparatus.

The Ritestone Products Co., Westchester Avenue and Bronx River, New York, manufacturer of waterproof magnesite stucco products, is reported to be planning the establishment of a new mill at Jacksonville, Fla. A temporary plant will be arranged, using one of the buildings of the Union Terminal Co., recently leased. D. W. Pye is president; E. L. Cline is secretary.

The City Council, Alexandria, La., has plans for extensions and betterments in the municipal electric light and power house, with the installation of additional equipment.

St. Louis

ST. LOUIS. Dec. 14.

POLLOWING the purchase of the Moloney Electric Corporation, Seventh and Hickory Streets, St. Louis, by the American Brown Boveri Electric Corporation, 165 Broadway, New York, the last noted company has plans for expansion in the works, including proposed acquisition of other interests in this section to cost \$1.500,000. terests in this section, to cost \$1,500,000.

The Marionville Cold Storage Co., Marionville, Mo., erect a four-story cold storage and refrigerating plant, 85 x 110 ft., to cost \$85,000 with equipment. Heckenlively & Mark, Landers Building, Springfield, Mo., are architects. F. O. Hawley is general manager.

The Northwestern Public Service Co., Columbus, plans extensions and improvements in its local operated electric power plant to cost \$100,000 with chinery.

The General Electric Co., Schenectady, N. Y., has purchased 155 acres in the northwest industrial district, St. Louis, for a plant for making electrical apparatus of a kind not yet announced.

The Arkansas-Missouri Power Co., Blytheville, contemplating the erection of a new ice-manufacturing plant at Kennett, Mo., to cost about \$50,000 with equipment.

The Fort Worth & Rio Grande Railway Co., St. Louis, will rebuild the portion of the locomotive shops at West Tulsa, Okla., recently destroyed by fire, estimated to cost \$60,000. The bulk of loss was confined to the machine shop.

The Metropolitan Utilities District, City Hall, Omaha, Neb., has plans for a two-story and basement machine repair, service and garage, and equipment shops, estimated to cost \$210,000 with machinery. T. A. Leisen, City Hall, is architect.

The American Fixture & Show Case Mfg. Co., 1007 Luca Street, St. Louis, will rebuild the portion of its plant at 917 North Tenth Street, recently destroyed by fire with loss

The Common Council, Enid, Okla., will install pumping The complete plant will cost \$215,000. machinery municipal

The Missouri-Portland Cement Co., 1208 Federal Reserve Bank Building, Kansas City, Mo., is reported to be con-cluding negotiations for property at Earnhearts, Ark., as a site for a proposed mill, to include power house and machine shop, estimated to cost \$800,000 with machinery.

Charles Page, Sand Springs, Okla., president Sand Springs Cotton Mill Corporation, is at the head of a project to construct and operate three hydroelectric generating plants on the Illinois River, reported to cost \$3,000,000 with transmission system. Two stations will be located in Adair and Cherokee Counties, while the third will be built in Arkansas.

The Modern Auto Repair Co., 4613 Olive Street, St. Louis, has awarded a general contract to McCormick & Son, Columbia Avenue, for a one-story addition to cost \$40,000 with equipment. Hellmuth & Hellmuth, De Menil Building, are architects.

The Camden Carbon Co., Camden, Ark., is arranging for the erection of a new plant at Carbondale, Ark., to cost \$75,000 with machinery. Benjamin F. Reeves is general manager.

The St. Louis Board of Aldermen has authorized a bond issue of \$2,600,000 for the new waterworks plant now under construction at Howard's Bend on the Missouri River, which will include a filter plant to cost \$1,225,000; two 30,000,000-gal. pumps, \$412,500; two 40,000,000 and one 60,000,000 gal. pumps, \$237,500; boilers and ash-handling equipment, \$525,000, and additional hurdle dykes, \$200,000.

Detroit

DETROIT, Dec. 14.

FUND of \$3,000,000 has been arranged by the Oakland A Motor Car Co., Pontiac, Mich., for enlargements and improvements in its plant, covering an expansion program for the early months of 1926. It is purposed to add facilities to increase the working force by 2000.

The Fitz-John Co., Muskegon, Mich., manufacturer of automobile bus bodies, has plans under way for a new unit to increase the output about five complete bus bodies per It is reported to cost \$45,000 with machinery.

The Board of Education, Baraga, Mich., plans the installation of manual training equipment in its proposed new high school to cost \$100,000, for which bids will soon be asked on a general contract. F. E. and G. P. Parmelee, Commercial Bank Building, Iron Mountain, Mich., are architects.

The Menominee Lumber & Cedar Co., North State Street,

Menominee, Mich., has plans under way for a two-story mill, 65 x 85 ft., to cost \$45,000 including equipment.

Merger plans have been arranged by the Michigan Stove Co., 3310 East Jefferson Street, and the Detroit Stove Works, Inc., 6900 East Jefferson Street, Detroit. The consolidated company will be capitalized at \$3,000,000 and 1,100,000 shares of stock, no par value. Present factory space will total \$5 acres and plans are under consideration for further expansion. It is said that William T. Barbour, heretofore president Michigan Stove Works, Inc., will be executive head of the new company.

The Grandville Roofing Co., Grandville, Mich, has plan under way for a one-story addition to cost \$20,000 with equipment.

The Monarch Governor Co., 1832 Bethune Avenue, troit, will proceed with a two-story addition to its plant to cost \$35,000, for which a general contract has been let to the Malow-Barry Co., Detroit.

The Crittall Casement Window Co., 10951 Hearn The Crittal Casement Window Co., 1995; Hearn Avenue, Detroit, has awarded a general contract to the Albert A. Albrecht Co., Penobscott Building, for a one and two-story addition, 80 x 300 ft., to cost \$70,000 with equipment. Murphy & Burns, \$456 Cass Avenue, are architects.

The Chamber of Commerce, Lansing, Mich., is in nego-The Chamber of Commerce, Lansing, Mich., is in negotiation with an aircraft manufacturing company, name temporarily withheld, which contemplates the construction of a local plant to cost close to \$100,000 with equipment. A site is being selected. Charles H. Davis is secretary of the Chamber of Commerce.

The Murray Body Co., 1975 Clay Avenue, Detroit, manufacturer of automobile bodies, has awarded a general contract to the Otto Misch Co., 159 East Columbia Street, for a six-story addition to cost \$175,000. J. R. Murray is president.

The Glick Iron & Metal Co., Jackson, Mich., has plans under way for a three-story addition, 50 x 100 ft.

The Kuhlman Electric Co., Bay City, Mich., will proceed with the construction of a one-story addition, 75 x 250 ft., and proposes to manufacture transformers of larger size than previously made. It will cost about \$90,000.

The Buick Motor Co., Flint, Mich., a division of the General Motors Corporation, Detroit, will begin work on a one-story addition, 360 x 990 ft., exclusively for the manufacture of automobile engines. It is purposed to develop an output of 1200 complete engine units per day.

Pittsburgh

PITTSBURGH, Dec. 14.

THE market appears to have entered a seasonal lull. The year as a mind. however, and with considerable business pending, the trade is not disposed to complain, This district has not fared as well as some others in machine tool sales, owing, perhaps, to the lack of automotive and railroad buying, business being pendent chiefly on the steel industry and a number of comparatively small machine shops. Erie Steam Shovel Co. recently bought two lathes.

The Lustro Coated Sheets Co., 1312 Sheffield Street, Pittsburgh, manufacturer of steel sheets, etc., has acquired property on Ridge Avenue, 116 x 315 ft., for \$36,000, and contemplates using for extensions in its plant.

The Union Truck & Auto Spring Co., 5855 Alderson Street, Pittsburgh, is said to be planning the construction of new works to cost about \$50,000. A. G. Wallerstadt heads the company

The Pittsburgh Malleable Iron Co., Thirty-fourth and Smallman Streets, Pittsburgh, is disposing of a bond issue of \$400,000, the proceeds to be used in part for payment of land and buildings recently acquired from the Pittsburgh Piping and Equipment Co., for expansion, and for remodeling, improvements, equipment, etc. Frank Moore is presi-

Frank T. Page, Pittsburgh, will operate a brazing and welding plant at 4404 Liberty Avenue.

The Ohio Public Service Co., Cleveland, is completing plans for a new steam-operated electric power house at Dillies Bottom, Ohio, near Moundsville, W. Va., to cost \$6,000,000 with steel tower transmission system.

The Union Switch & Signal Co. Swissvale, Pittsburgh, will soon begin the construction of a one-story forge and machine shop, 25 x 120 ft., to cost \$45,000 with equipment.

The Pennsylvania Railroad Co., Pittsburgh, will soon begin the construction of an addition to its scrap-handling plant at Conway, Pa., with the installation of hoisting, conveying and other machinery.

The Overhead Door Co., Lewistown, Pa., manufacturer of patented doors and equipment, has acquired a 4-acre tract from the Lewistown Housing & Development Co, and will soon have plans drawn for a new plant to cost \$70,000 with machinery.

F. D. Saupp, Inc, Center Avenue, Pittsburgh, has plans for a two-story automobile service, garage and repair building, 105 x 150 ft, to cost \$140,000 with equipment. Eric F. Wood & Co., Oliver Avenue and Smithfield Street, is architect.

The Board of Education, Fulton Building, Pittsburgh, George W. Gerwig, secretary, plans the installation of manual training equipment at its proposed four-story Henry Clay Frick school to cost \$500,000. Ingham & Boyd, Empire Building, are architects.

Indiana

INDIANAPOLIS, Dec. 14.

TENTATIVE plans are being considered by the George Cutter Co., South Notre Dame Avenue, South Bend, Ind., manufacturer of electrical equipment and supplies, for a new factory group, consisting of machine shop, foundry, assembling and other buildings, to cost close to \$1,000,000 with machinery. The company is a subsidiary of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Bernard H. Prack, Martin Building, Pittsburgh, is architect and engineer.

Fire, Dec. 3, destroyed a one-story vocational shop, used for plumbing, pipe fittings, etc., at the Indiana State Reformatory, Pendleton, Ind. An official estimate of loss has not been announced, nor statement regarding rebuilding. F. Miles is superintendent.

The Kelly Axe & Tool Co., Charleston, W. Va., has leased property at Evansville, Ind., with 1000 ft. of frontage

on the Ohio River. Plans are under way for a new terminal to include the installation of three 5-ton electric-operated loading cranes and other freight-handling elevating and conveying equipment.

The Doddridge Casket Co., Milton, Ind., contemplates rebuilding the portion of its plant recently destroyed by fire. The new structure will be one-story, 32×70 ft. Joseph Helms is manager.

H. L. Bornman, Indianapolis, has arranged for the removal of his tin and metal-working shop from 3403 East Tenth Street to 3309 East Tenth Street, where facilities will be provided for increased output.

The American Closet Valve Co., Indianapolis, is planning the erection of a one-story addition in the Mars Hill section, where a larger plant was recently acquired. It will be designed primarily as a foundry for gray iron casting production.

The New York Central Railroad Co., Grand Central Terminal, New York, has plans under way for a one-story locomotive testing shop at its works at Elkhart, Ind., to cost \$65,000 with equipment. W. R. Lye is superintendent of motive power.

The Turner Mfg. Co., 112 West Jefferson Street, Kokomo, Ind., manufacturer of automobile equipment, is laying foundations for a one-story addition, 82×137 ft., to cost \$25,000. E. E. Dunlap, 1125 North Buckeye Street, is architect.

The Wabash Township School Board, Jesse W. Brockway, trustee, West Lafayette, Ind., is considering the installation of manual training equipment in its proposed two-story and basement high school at Klondike, Ind., to cost \$110,000, for which bids have been asked on a general contract. W. O. Kashner, 310 South Michigan Avenue, Chicago, is architect.

The Building Brick Co. of Illinois, Inc., Brazil, Ind., G. E. Luce, general manager will soon begin work on its proposed new plant at Sundown near Brazil, including power house and machine shop, estimated to cost \$400,000 with machinery.

The Board of Education, Terre Haute, Ind., has completed plans for a two-story machine and automobile shop, 102 x 139 ft., to cost \$60,000 with equipment. A portion of the Gerstmeyer high shool building will be remodeled for the purpose. Johnson, Miller, Miller & Yeager, 30 North Fifth Avenue, are architects.

Pacific Coast

SAN FRANCISCO, Dec. 9.

BIDS will be received by the superintendent, East Farm Indian Sanatorium, Phoenix, Ariz., until Jan. 5, for one 75-hp. horizontal return tubular boiler, 125 lb. working pressure.

The Northwestern Electric Co., Portland, Ore., has plans for a two-story equipment repair and storage building, 100 x 200 ft., in the Albina district, to cost \$125,000. Martin Schact, Yeon Building, is architect.

The Board of County Supervisors, San Bernardino, Cal., has plans for a one-story machine shop, service and garage, 60×150 ft., for County automobiles.

The Spaulding Logging Co., Salem, Ore., will soon begin the construction of a one-story shingle mill in the Willamette South district to cost close to \$100,000 with machinery. A power house is planned.

The Palmer Lumber & Mfg. Co., Chehalis, Wash., has plans for a two-story addition, 30 x 103 ft., with L-extension, 45 x 45 ft.

The Union Ice Co., 354 Pine Street, San Francisco, is arranging for the erection of a new ice-manufacturing plant at Auburn, Cal., estimated to cost \$65,000. The company engineering department is in charge.

The Board of Trustees, Ontario, Cal., will soon ask bids for pumping machinery and auxiliary equipment in connection with extensions and improvements in the municipal waterworks, for which a bond issue of \$175,000 recently was approved. O. S. Roen is city service manager, in charge.

The Eureka Paper Box Co., Los Angeles, has plans for a two-story factory, 65 x 120 ft., to cost \$45,000 with equipment. John M. Cooper, Rives-Strong Building, is architect.

The Southern California Edison Co., Los Angeles, has approved an appropriation of \$305,000 for extensions and improvements in its plant and system in the Tulare, Cal., district. A fund of \$190,000 has been appropriated for similar use at Delano, Cal., and \$175,000, at Lindsay, Cal., and vicinity.

The Eastman Kodak Co., Battery and Sacramento Streets, San Francisco, has awarded a general contract to Cahill Brothers, 55 New Montgomery Street, for a two-story addition to cost \$55,000.

The San Joaquin Light & Power Corporation, Fresno. Cal., has authorized a fund of \$1,000,000 for the construction of two new automatic power substations at Rose and Rio Bravo, in the Bakersfield, Cal., district, including transmission line extensions.

The Fidalgo Pulp Co., Anacortes, Wash., has plans under way for rebuilding the portion of its local mills recently destroyed by fire, with loss close to \$50,000 including equipment. C. B. Everitt is general manager.

Fred Meier, Woodland, Cal., has plans for a new automobile service, garage and repair building, to replace a structure recently destroyed by fire with loss of about \$100,000. The new shop will cost close to a like amount.

The Board of Education, Ventura, Cal., plans the installation of manual training equipment in a proposed two-story high school to cost \$250,000, for which plans are being drawn by Austin & Ashley, Chamber of Commerce Building, Los Angeles, architects.

The Bethlehem Shipbuilding Corporation, San Francisco, has taken contract for the construction of an oil extraction plant near Santa Maria, Cal., for the N-T-U Co., of that place. The oil will be extracted from shale on a basis of 1000 bbl. per day. The plant will cost \$400,000.

Canada

TORONTO, Dec. 14.

MACHINE tools sales the past week were confined almost entirely to units of one or two. Although several large industrial plants are nearing completion, no extensive tool buying has resulted, but inquiries are beginning to make their appearance and it is expected that business in this connection will develop after the first of the year. A good demand exists for both new and rebuilt tools. The automotive industry in general continues the most active buyer at present. Railroads are doing very little, although occasional orders are appearing for replacements. The general tone of the market is bright and the opinion is expressed that with prospective business now in sight demand for tools should improve during the early months of next year.

The J. D. Irvin Co., Ltd., Buctouche, N. B., proposes to start work soon rebuilding a lumber mill recently destroyed by fire. The owner is interested in equipment.

E. C. St. Amour, 1360 Papineau Street, Montreal, will start work immediately on the erection of a garage and repair shop and will purchase equipment.

The George Bilton Furniture Co., 27 Sackville Street, Toronto, will build an addition to its factory on Bowman Street.

C. B. Dolphin, architect, 61 Adelaide Street East, Toronto, is calling for bids for erection of a garage at the corner of Adelaide and York Streets to cost \$300,000. Equipment will be purchased later.

Cutten & Foster, 23 Sherbrooke Street West, Montreal, manufacturers of automobile tops, accessories, etc., have awarded a general contract to G. Martel, 5626 Park Avenue, for the erection of a factory on Dorchester Street to cost \$50.000.

The mining mill and shaft house of the Kirkland-Rand Mines, Kirkland Lake, Ont., were destroyed by fire with a loss of \$200,000 to buildings and machinery. The owners will rebuild next spring.

The Hamilton Cataract Power, Light & Traction Co., Hamilton, Ont., has awarded a general contract to W. W. Park, 49 Queen Street, St. Catharines, Ont., for repairs to a power house at St. Catharines recently damaged by fire.

The Superior Barn Equipment Co., Fergus, Ont., manufacturer of stable fixtures, machinery, etc., is preparing to start work on an addition to its plant.

The Lakefield Lime Products, Ltd., Stoney Lake, Ont., has been incorporated with a capital stock of \$300,000 and will start work immediately on the erection of a plant tomanufacture lime and chemical products. Plans include the erection of a rotary kiln of 25 tons capacity; a 15-ton hydrator and tunnel kiln and two ring roll mills for the manufacture of fillers used in the manufacture of rubber, paper, glass, paint, etc. The directors include C. H. Ackerman, Peterborough; A. T. Lefevre, Pripre, Chile; J. W. Allan, Rochester, N. Y.; J. C. Strickland and C. E. Strickland, Lakefield, Ont. Officers are: President, C. H. Ackerman; managing director, C. E. Strickland; secretary-treasurer, J. C. Strickland; supervising engineer and chemist. Dr. Louis C. Jones, New York, and Frank A. Delisle, Buffalo.

Foreign

BIDS will be received by the Public Works Supplies and Tenders Committee, Auckland, New Zealand, until Feb. 16 for airbrake switches, isolating switches, choke coils, insulators, circuit breakers, spare parts, etc., for the Bombay substation and other power enterprises.

The Public Works Department, Government of Italy, Rome, has approved an appropriation of \$1,440,000 for extensions and improvements in the harbor at Ancona, to include the construction of docks, installation of cranes and other material-handling and conveying machinery, improvement in quays, etc., to provide docking facilities for at least 15 vessels at one time. The American Consulate, Rome, Ralph A. Boernstein, vice-consul, has information regarding the project.

Clark, Brangwin & Co., Ltd., 21-23 Chiswell Street, London, E.C.1, England, has inquiries out for an American company in position to furnish galvanized plain sheets, 26 B.W. gage, suitable for trunk manufacture. The initial order will total about five tons.

The Government of Ireland, Dublin, is completing arrangements, in cooperation with a syndicate, for the construction of a new beet sugar mill at Carlow. The plant will have an initial capacity of about 70,000 tons per annum and is estimated to cost close to \$2,000,000 with machinery. The American Consulate, Dublin, Harold M. Collins, consul, has information regarding the project.

Industrial Notes

The Ziv Steel & Wire Co., 4423 West Kinzie Street, Chicago, has been appointed agent for the line of rock drills, pneumatic tools and accessories of the Gilman Mfg. Co., East Boston, Mass. The territory in which the Ziv company has exclusive agency includes all of Wisconsin, Indiana and Minnesota and parts of Illinois and Michigan. A large office and warehouse building, being erected by the Ziv company at 2945 to 2951 West Harrison Street, Chicago, is nearing completion. The hew building will provide space for stocks of Gilman machines and repair parts, as well as for the usual other stocks carried by the company.

William H. Muller & Co., 11 Broadway, New York, have taken over the raw material department of Buck, Kiaer & Co., 9 East Forty-sixth Street, New York, and Leonard J. Buck has been made a vice-president and director of the Muller company, in charge of the ore department, handling the sale of foreign iron ores and manganese ore under the agency contract with the Harriman interests. Buck, Kiaer & Co. were agents for the British-American Nickel Co. and for the fluorspar mines at Blackwell, England.

The Weliman Bronze Co., 6017 Superior Ave., Cleveland, has purchased the equipment and goodwill of the City Brass Foundry Co. of Cleveland. The equipment will be moved to the Wellman plant and located in an addition now under construction. As the products of both companies have been the same—brass, bronze and aluminum castings—great economies and increased output are expected. The officers of the company will remain the same, except for the addition of George B. Hammink, former president of the City Brass Foundry Co., as vice-president. Fred S. Wellman is president.

An increase in the number of shares outstanding for the Hurley Machine Co., Cicero, Ill., a change of name to the Electric Household Utilities Corporation and the entrance of the company into the electric refrigerator business on a large scale are forecast in a letter sent out Dec. 5 to stockholders. A special meeting has been called for Dec. 28 to consider the changes.

The Freyn Engineering Co., 310 South Michigan Avenue, Chicago, recently shipped ten electric roll heaters to the Tennessee Coal, Iron & Railroad Co. for the new sheet mill at Fairfield, Ala. Other recent orders for electric roll heaters include three for the Reeves Mfg. Co., Milford, Conn.; three for the American Rolling Mill Co., Middletown, Ohio; three for the Pacific Sheet Steel Corporation, 120 Broadway, New York; one for the International Nickel Co., 67 Wall Street, New York, and nine for the Kawasaki Dock Yard Co., Kobe, Japan.

The Max L. Israel Co., Dayton, Ohio, has purchased the site and building formerly occupied by the Dayton City Railway power plant and will use the property as a warehouse for structural steel shapes, cold and hot-rolled strip steel, galvanized and black sheets and contractors' supplies. About the first of the year the company will be in the market for complete equipment for the fabrication of structural steel.

The Michigan Copper & Brass Co., Detroit, manufacturer of copper, brass and aluminum sheets, has awarded the

Austin Co., engineer and builder, Cleveland and Detroit, a contract for an aluminum smelting building. This is the second recent addition for this rapidly growing Michigan company.

Manufacture of the principal brass valve lines of the McNab & Harlin Mfg. Co, will be continued at Mount Morris, N. Y. The Mount Morris Valve Corporation has purchased the patterns, the old "MH" trade-mark rights, and all items of good will applying to the standard lines of "MH" brass valves; also the pick of the modern foundry and machine shop equipment used by the old company, and supplemented this by purchase of new machinery. The company has erected modern type fireproof foundry and shop buildings on a large tract of land located on the main line of the Lackawanna Railroad. Mount Morris is also on the Eric and Pennsylvania systems, so that the company has excellent shipping facilities. There is in immediate prospect at Mount Morris a remarkable hydroelectric development at the lower end of the Genesee River gorge about a mile away. The dam and power house at this point will have an output of some 60,000 hp., which will supply Mount Morris and the whole Genesee Valley with cheap and reliable power. The Mount Morris Valve Corporation is in position to take advantage of this situation by the use of electric furnaces, which produce excellent brass and bronze castings.

The Iowa Foundry & Mfg. Co., Fort Dodge, Iowa, has renewed its charter and organization for a second 20-year period, as the company was organized more than 20 years ago and the old organization period had expired. The company has a gray iron foundry and a machine job shop, and manufactures concrete mixers, four styles mounted on skids, without power, and three styles mounted on trucks, with or without power. The company manufactures also foundation coal chutes, farm drainage grate castings, city sewer drainage castings and brass and aluminum castings.

The American Oil Burner Co., 701 Calvert Building, Baltimore, recently incorporated with \$50,000 authorized capital and \$12,000 paid in to date, will contract for the installation of oil burner equipment. The company will buy the various parts and assemble them at places of installation. William P. Pennington is president and Robert F. Gibson secretary.

Trade Changes

Arthur C. Bisgood, Bridgeport, Conn., machinery, has purchased the business and stock of Gledhill & Co., that city who have been in the machinery business for 45 years.

Rolls-Royce of America, Inc., Springfield, Mass., has acquired control of Brewster & Co., Long Island City, N. Y., automobile bodies. William Brewster, president, will continue in that office and also will be a vice-president of the Springfield company. The Brewster company was founded in 1810, by James Brewster.

The Dorr Co., engineer, 247 Park Avenue, New York, has appointed E. L. Bateman, Corner House, Johannesburg, as sole agent for its equipment in South Africa.

The Austin Co., Cleveland, engineer and builder, has opened an office in Miami, Fla., in charge of H. L. Cornelison, formerly sales engineer for the company in the Cleveland district.

The Swedish Steel Sales Co., Ltd., has combined its general office and warehouse at 431 Kent Avenue, Brooklyn, where it will carry a stock of Swedish iron, welding wire and tool steel.

Branch Office Representatives of The Iron Age

Editorial

Chicago, Otis BldgR. A. Fiske	
Pittsburgh, Park Bldg	
Cleveland, Guardian BldgF. L. Prentise	
Cincinnati, First National Bank Bldg Burnham Finney	
Boston, Park Square Bldg	
Washington, Investment Bldg W. Moffett	
San Francisco, 320 Market St Charles Downes	

Advertising

Chicago, Otis Bldg F. B. Wayne
Pittaburgh, Park Bldg
Cleveland, Guardian Bldg Emerson Findley
Cincinnati, First National Bank Bldg D. G. Gardner
Boston, Park Square Bldg
Philadelphia, Widener BldgCharles Lundberg
Buffalo, Ellicott Sq B. L. Herman
Detroit 7838 Woodward Ave
Hartford, Conn., P. O. Box 81
Northern New Jersey, Hotel Regent, 93 Bleecker St.,
Newark, N. J
Non- West Con Wast Phisty-Ninth St
P. W. Schultz, C. L. Rice, E. Sinnock
San Francisco, 320 Market St

Current Metal Prices

On Small Lots, Delivered from Stocks, New York

THESE price lot buyers	es are whose	given requi	for	the ents	con do	veni	ence	of s	small- mill-
size orders.									

Only base prices can be listed in some cases, due to limits of space; other items of a given group are deducible from the base price.

The prices which are quoted below are those at which small lots may be bought, whether from jobbers' or other stocks.

Complete market reports and prices on large shipments from mills will be found elsewhere under "Iron and Steel Markets" and "Non-Ferrous Metals."

deducible from the base price.	and Steel Markets" and "Non-Ferrous Metals."
Bars, Shapes and Plates Per Lb.	Brass Sheet, Rod, Tube and Wire
Bars: Refined iron bars, base price	High brass sheet
	Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.
Merchant Steel Per Lb.	Tin Plates
Tire, 1½ x ½ in. and larger	Bright Tin Grade "AAA" Charcoal Charcoal 14x20 IC. \$11.25 \$8.85 IX. 12.85 10.85 IXX. 14.40 12.55 IXXX. 15.75 18.85 IXXX. 17.00 15.05 IXXX. 11.35 10.10 Coke—14x20 Prime Seconds 80 lb. \$6.15 \$5.90 90 lb. 6.30 6.05 100 lb. 6.45 6.20 IX. 7.85 7.60 IXX. 9.00 8.75 IXXX. 10.35 10.10 IXXXX. 11.35 11.10
High-speed steel, 18 per cent tungsten70c.	Terne Plates 14 x 20
Sheets Blue Annealed Per Lb. 3.89c. No. 12 3.94c. No. 14 3.99c. No. 16 4.09c.	IC—8-lb. coating
Box Annealed—Black	Bar69c. to 69%c.
Soft Steel C. R. One Pass Per Lb. Sheets Per Lb.	Copper Lake ingot
Galvanized	Lead and Solder*
No. 14 4.45c. to 4.60c. No. 16 4.60c. to 4.75c. Nos. 18 and 20 4.75c. to 4.90c. Nos. 22 and 24 4.90c. to 5.05c. No. 26 5.05c. to 5.20c. No. 28* 5.35c. to 5.50c. No. 30 5.85c. to 6.00c.	American pig lead
*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.	Best grade, per lb
Welded Pipe	Commercial grade, per lb30c. to 35c.
Standard Steel Wrought Iron	Antimony 991/a to 991/a
## in. Butt 46 29	Asaitic
7 & 8 in. Lap. 44 17 8-6 in. Lap 11 + 6 11 & 12 in. Lap. 37 12 7-12 in. Lap 3 +16	
11 & 12 in. Lap. 37 12 7-12 in. Lap 3 +16 Bolts and Screws	Business is quiet and values practically unchanged. Dealers' buying prices are as follows:
Machine bolts, cut thread, 40 and 10 per cent off list Carriage bolts, cut thread, 30 and 10 per cent off list Coach screws, 40 and 10 per cent off list Wood screws, flat head iron, 80, 20, 10 and 5 per cent off list Steel Wire Base Pricet on No. 9 Gage and Coarses Per Lb.	Cents
Bright, basic 4.25c. Annealed, soft 4.50c. Galvanized, annealed 5.15c. Coppered, basic 5.15c. Tinned, soft Bessemer 6.15c. †Regular extras for lighter gage.	No. 1 yellow brass turnings. 8.50 No. 1 red brass or composition turnings. 8.00 Lead, heavy 7.75 Lead, tea 6.00 Zine 5.25

